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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF CHEMISTRY.

BULLETIN No. 30.

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EXPERIMENTS
WITH
SUGAR BEETS
IN
1890.

BY

HARVEY W. WILEY,

Chemist of the U. S. Department of Agriculture and Director of the Department Sugar Experiment Stations at Schuyler, Nebraska; Runnymede (Narcoossee P. O.), Florida; and Sterling and Medicine Lodge, Kansas.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE.

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GOVERNMENT PRINTING OFFICE.
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PREFATORY NOTE.

U. S. Department of Agriculture,
Division of Chemistry,
Washington, D. C., March 28, 1891.

Sir: I submit for your inspection and approval the manuscript of Bulletin No. 30 of the Chemical Division, containing a record of the experiments made by the Department in 1890 with sugar beets.

The work of the Department recorded in this bulletin consists chiefly of analyses of samples of beets grown in many different States. In addition to this work, a few culture experiments, on a small scale, were carried on under the supervision of the Department. A chemist from this Division was also stationed at the Grand Island Sugar Factory, in Nebraska, and data of the greatest value were secured at that place.

Special studies of the whole subject of the growth of the sugar beet and the manufacture of sugar therefrom were published in Bulletin No. 27. In Farmers' Bulletin No. 3 have been published full instructions for the culture of the sugar beet. The data contained in these two bulletins are supplemented by the facts recorded in the present one, which show further that beets of fine quality and well suited for manufacturing purposes can be grown in the United States.

So conclusive have been the results obtained as to fully justify the action of the Department in establishing a culture station at Schuyler, Nebraska, for the more exact study of the conditions of the most successful methods of growing sugar beets in this country.

Respectfully,

H. W. Wiley,
Chemist.

Hon. J. M. Rusk,
Secretary of Agriculture.

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EXPERIMENTS WITH SUGAR BEETS IN 1890.

PURCHASE AND DISTRIBUTION OF SEEDS.

From Mr. Henry T. Oxnard, the Department purchased 3 tons of sugar-beet seed, of which the greater portion was the variety known as the Klein Wanzlebener, grown by Dippe Brothers, of Quedlinburg. In addition to this, however, smaller quantities of the White Improved Vilmorin were purchased, together with the varieties of beets grown by Lemaire, Simon Legrand, Florimond, and Bulteau Desprez. These different varieties were put in one-pound packages and sent to over one thousand different persons who had made special inquiry for them. Accompanying these packages were directions for preparing the soil and planting and cultivating the beets. Directions were also sent for harvesting and sampling the beets and for sending samples to the Department for analysis. Nearly one thousand samples of beets were received by the Department, of which the analyses were made and the results communicated to the farmers sending them. In addition to this work a large number of the beet plots were personally inspected by agents of the Department, and particular inquiry was directed to a large number of farmers in regard to the methods of cultivation which they had pursued.

Only in a few instances were the directions of the Department followed out to the letter. In most cases the planting and cultivation of the beet seed were conducted according to such methods as the agriculturist might hit upon at the time. From the information gathered it was found that the chief variation from the instructions was in the preparation of the soil. In very few cases was a subsoil plow used and most of the beets which were sent to the Department were evidently grown in soil of insufficient depth. In some cases, where the exact directions for cultivation were carried out, the character of the beets received showed by contrast with the others the absolute necessity of employing the best methods of agriculture for their production.

It was not thought best the first year to make any effort to obtain from the farmers the exact yield of their beets per acre. The difficulty of securing such information is almost insurmountable. In the first place the amount of land under cultivation is usually guessed at, and in very few cases are exact measurements made. The results, therefore, at best are only estimates unless the absolute control of measurements and weights can be secured. It was thought best, therefore, to depend for estimates of yield upon the actual quality of the beets produced, since it is well known that about 40,000 beets of fair quality can be produced upon an acre. It is therefore fair to presume that the yield per acre would be, within ordinary limits, the weight of the average beet sent for analysis multiplied by 40,000. When, however, it is necessary to speak of the beets weighing over one pound the rule no longer holds good, as it would be evidently impracticable to grow 40,000 beets of such a size upon an acre. It is fair, however, to estimate the yield upon beets weighing about 1 pound at 40,000 per acre or 20 tons. It is not meant by this that a yield of 20 tons can be obtained by farmers at the beginning, for this is not the case; it is only exceptionally that such a yield can be secured. When, however, the exact methods of beet culture are thoroughly understood and the method of fertilizing and preparing the soil studied, it will not be difficult, with favorable climatic conditions, to secure a yield of beets equal to 20 tons per acre.

EXPERIMENTS AT FACTORIES.

By the courtesy of the managers of the company the Department was permitted to station a chemist at Grand Island, who had charge of the sampling of the beets as they came to the factory in wagons or carloads. Nearly three thousand analyses of samples were made and the full tabulated reports of these analyses will be found following. The proprietors of the factory were so encouraged by the season's work that they have decided to erect another large factory at Norfolk, Nebraska, and at the Chino Ranch in southern California, and work on these factories is now going on.

Manufacturing experiments, on a small scale, with sugar beets, were also carried on during the season just past at Medicine Lodge, Kansas. About 80 acres of beets in all were harvested for the factory, and a summary of the work done will be given in another place.

FINANCIAL RETURNS TO BEET-GROWERS.

In general, the following remarks may be made concerning the last season's work in the beet-sugar industry, from a commercial point of view, in Nebraska and Kansas.

The summer in both localities was exceptionally dry. For this reason and on account of lack of knowledge among the farmers in regard to the proper methods of raising beets the average crop was very short. In Nebraska the exact tonnage can not be known, but probably it would not average more than 2 or 3 tons of beets per acre; in Kansas the average seems to have been somewhat higher. In many cases farmers obtained 10 and even 15 tons of beets per acre, showing that even in adverse conditions of season a reasonably large crop may be harvested when all other conditions necessary to the proper growth of the crop are attended to.

As might well be expected from the small yield, the farmers in general were dissatisfied with the season's work. It is not reasonable to expect satisfaction from a crop of so low an average when the labor of growing it is so great; but while the farmers are dissatisfied it must be confessed that a great deal of this dissatisfaction must be attributed to their own lack of knowledge of the subject or to their disinclination to put upon the beet fields the proper amount of labor and culture at the proper time. Instead of being therefore deterred from continuing the production of sugar beets, it would seem wiser on the part of the farmers to study carefully the methods of agriculture pursued by those who made a success of beet culture, and to imitate those methods during the coming season. The fact should not be forgotten, however, that even with the poor results obtained the beet crop was uniformly better than the average of other crops in the same locality.

It would be useless to hold out to the farmer the hope of financial reward from a beet crop which would average only 3 tons per acre; but if from this acre he could produce 10 to 15 tons of beets then his venture would prove financially successful. In order that the manufacture of beet sugar should become an established commercial success, the factories and the farmers must work in harmony. The method pursued in France and in Germany would probably be best suited to bring about this result. In those countries the beet growers themselves are usually shareholders in the factories, and thus participate in the profits. It is probable that the annual dividends of German and French beet-sugar factories do not fall below 10 per cent net on the capital invested. The farmer, therefore, who has even a small interest in such a factory secures a handsome profit on his invested capital. At the same time he has a vote in the board of directors and is personally interested in the success of the factory. In many factories of Europe the stock is thus held by the beet-growers. If, on the other hand, the whole of the factory be owned by the capitalists, then there is a cause for continual conflict between the interests of the farmer and the interests of the manufacturer, although this conflict is perhaps more in theory than practice. Even if the factory be owned exclusively by the capitalists, it is to their interest to work in harmony with the farmers, in order that they may secure a crop of sufficient magnitude to render the operation of their factory profitable.

It perhaps, however, would be unavoidable at the beginning of the industry that a feeling of animosity should exist between the beet-grower and the manufacturer. After a few years the prices to be paid for beets and other agreements with the farmers will doubtless be adjusted on a scale of equity and satisfacton to all concerned. In case farmers have no money to put into beet-sugar factories they might take shares of stock and pay for them with beets during the first and second years; in this way they would secure a financial interest in the company, own their shares of stock, and pay for them from the proceeds of the field without investing in ready cash. By adopting some such plan as this it might be possible to get every beet-grower within reach of the factory to become himself interested as a stockholder.

ANALYTICAL DATA RELATING TO BEETS GROWN FROM SEED PURCHASED BY THE DEPARTMENT.

The samples of beets which were sent to the Department in response to the request already noted were immediately analyzed and the results of the analyses communicated to the growers of the beets. Returns were received from a great many States, but principally from Nebraska and Minnesota.

The data obtained follow arranged alphabetically by States and counties:

CALIFORNIA.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Los Angeles County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
University of California.	7616	Excelsior	Sept. 27	16.3	15.5	84.5	18.1	.90	407
Do	7617	Imperial	Sept. 27	14.9	14.2	80.5	15.1	.99	372
Do	7618	Imperial Improved	Sept. 27	13.9	13.2	82.2	12.4	1.12	397
Do	7619	Vilmorin	Sept. 27	16.8	16.0	87.0	17.9	.94	352
Average				15.5	14.7	84.6	15.9	.99	382

COLORADO.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Garfield County.									
A. J. Saint	7956	Klein Wanzlebener	Oct. 23	13.7	13.0	74.1	9.9	1.39	405
Larimer County.									
C. S. Crandal	8035	Bulteau Desprez	Oct. 27	16.0	15.2	86.0	16.9	.95	395
Do	8036	do	Oct. 27	15.5	14.7	84.7	16.3	.95	460
Do	8037	Vilmorin	Oct. 27	13.6	12.9	76.8	13.7	.99	1,320
Do	8038	Klein Wanzlebener	Oct. 27	15.9	15.1	86.0	16.7	.95	805
Do	8039	Florimond Desprez	Oct. 27	16.2	15.4	84.4	18.0	.90	475
Do	8040	Simon Legrand	Oct. 27	12.1	11.5	80.2	12.9	.94	665
Wm. Boyce	8096	Lane's Imperial	Nov. 1	13.4	12.7	81.3	14.1	.95	390
Average				14.7	14.0	83.2	15.5	.95	644
Mesa County.									
H. R. Rhone	8073		Oct. 30	15.2	14.4	86.4	13.0	1.17	453
Phillips County.									
C. R. Peters	7766	Florimond Desprez	Oct. 10	12.6	12.0	69.9	8.5	1.49	533
Do	7767	Klein Wanzlebener	Oct. 10	14.6	13.8	74.9	10.5	1.39	755
Mrs. M. Peters	7785	Florimond Desprez	Oct. 10	13.7	13.0	71.0	7.1	1.99	620
Average				13.6	12.9	71.9	8.7	1.62	638
Prowers County.									
A. R. Black	7789	Colorado Imperial	Oct. 11	9.6	9.1	66.2	5.8	1.67	533
Do	7793	California Legrand	Oct. 11	9.2	8.7	67.6	5.7	1.61	606
Do	7794	Florimond Desprez	Oct. 11	11.6	11.0	71.6	10.7	1.08	590
Do	7795	Colorado Vilmorin	Oct. 11	8.4	8.0	64.1	5.0	1.69	463
Do	7796	Klein Wanzlebener	Oct. 11	12.7	12.1	74.7	8.4	1.52	403
Average				10.3	9.8	68.8	7.1	1.51	519

COLORADO—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Pueblo County.				P. ct.	P. ct.			P. ct.	Gr'ms.
Pueblo Board of Trade	8177	....	Nov. 8	11.4	10.8	76.5	8.8	1.30	515
Do...............	8178	....	Nov. 8	15.5	14.7	82.9	13.3	1.17	650
Do...............	8179	....	Nov. 8	15.9	15.1	84.1	14.0	1.12	580
Do...............	8180	....	Nov. 8	15.4	14.0	83.7	14.3	1.08	485
Do...............	8181	....	Nov. 8	12.3	11.7	77.9	7.8	1.57	545
Do...............	8182	....	Nov. 8	10.6	10.1	70.2	10.3	1.03	690
Average.......	......	....	....	13.5	12.8	79.2	11.4	1.21	578
San Miguel County.									
C. F. Truax..........	8264	Vilmorin..............	Nov. 17	9.5	9.0	65.5	7.5	1.26	875
Do	8265	....	Nov. 17	11.3	10.7	66.1	7.4	1.53	765
Average.......	......	....	....	10.4	9.9	65.8	7.5	1.40	820
Yuma County.									
H. Hitchcock........	7871	Klein Wanzlebener ...	Oct. 15	12.6	12.1	75.9	10.4	1.21	720
Do	7872	....	Oct. 15	8.2	7.8	63.1	6.8	1.21	425
Average.......	......	....	....	10.4	9.9	69.5	8.6	1.21	573
County unknown.									
C. W. Zepp..........	8055	Simon Legrand........	Oct. 29	15.7	14.9	79.7	12.1	1.30	333
Do...............	8113	Klein Wanzlebener ...	Nov. 3	19.2	18.2	......	13.3	1.44	93
Average.......	......	....	....	17.4	16.5	79.7	12.7	1.37	213

CONNECTICUT.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Litchfield County.									
W. H. Barber........	7939	German Imperial	Oct. 21	10.8	10.3	76.1	7.1	1.53	410
Do	7940	....	Oct. 21	9.6	9.1	76.2	7.6	1.26	390
Average.......	......	....	....	10.2	9.7	76.1	7.4	1.40	400

IDAHO.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Ada County.									
N. F. Kimball........	7970	....	Oct. 24	8.4	8.0	68.3	9.0	1.21	100

ILLINOIS.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Kendall County.									
Peter Solomon.......	8029	....	Oct. 27	7.2	6.5	64.9	7.0	1.03	832
Pike County.									
Fred Epker..........	8170	....	Nov. 7	10.7	10.2	71.8	7.9	1.35	1,368
Platt County.									
G. H. Morse..........	8410	....	Nov. 22	6.4	6.1	61.0	4.3	1.48	685
Will County.									
J. W. Merrill	7787	White Sugar..........	Oct. 10	10.8	10.3	67.6	10.0	1.08	645
Henry Abbott.......	8108	do	Nov. 3	7.9	7.7	65.3	7.8	0.99	775
E. McAllister........	8266	French Richest......	Nov. 17	15.9	15.1	85.0	16.1	0.99	600
Do	8267	...do..................	Nov. 17	14.7	14.0	83.7	14.3	1.03	1,445
S. Mottinger.........	8299	German Imported....	Nov. 20	13.3	12.6	77.3	11.4	1.17	686
Average.......	......	....	....	12.5	11.9	75.8	11.9	1.05	830

INDIANA.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Benton County.									
				P. ct.	P. ct.			P. ct.	Gr'ms.
Thos. Schluttenhafer.	7373	Vilmorin	Sept. 22	12.6	12.0	79.2	16.4	.77	252
Do	7374	Klein Wanzlebener	Sept. 22	11.0	10.4	73.3	12.9	.85	322
H. W. Wiley	7607	do	Sept. 26	12.5	11.9	81.7	15.4	.81	417
Do	7776		Oct. 10	12.1	11.5	78.0	13.3	.91	500
Do	7777		Oct. 10	9.8	9.3	69.0	11.9	.82	470
Do	7925		Oct. 20	13.9	13.2	88.5	12.4	1.25	535
Do	7942		Oct. 22	13.9	13.2	84.8	14.6	.95	413
Do	8017		Oct. 27	13.4	12.7	95.0	16.5	.81	690
Do	8422		Nov. 25	14.6	13.9	81.1	16.2	.90	687
Joseph Gnetler	7778		Oct. 10	11.6	11.0	75.8	10.5	1.11	1115
Ole Olson	7945	Green Top	Oct. 22	8.5	8.1	66.9	6.3	1.35	1250
J. G. Bozemore	8072	White Sugar	Oct. 30	12.6	12.0	79.7	10.4	1.21	1320
John Patterson	8074		Oct. 30	12.2	11 6	73.5	12.3	.99	517
John Kaar	8079		Oct. 31	14.2	13.5	85.6	17.5	.81	900
J. H. Schott	8081		Oct. 31	13.8	13.1	85.7	16.7	.81	515
N. B. Nutt	8136		Nov. 5	15.0	14.2	87.7	15.8	.95	823
Oliver Nutt	8137		Nov. 5	13.5	12.8	84.4	18.8	.77	733
G. S. Kaar	8080		Oct. 31	13.2	12.5	84.1	15.3	.86	665
Joseph Gnetter	7779		Oct. 10	12.2	11.6	80.8	12.8	.95	1115
Average				12.6	12.0	80.8	14.0	0.94	697
Cass County.									
Henry Bloom	7670	Klein Wanzlebener	Oct. 4	14.6	13.9	88.0	22.1	.66	680
Do	7671	Florimond Desprez	Oct. 4	10.3	9.8	77.4	13.9	.74	810
G. W. Conrad	7952		Oct. 22	10.4	9.9	73.8	7.2	1.44	1100
M. L. Spice	8274		Nov. 17	14.8	14.1	66.4	8.6	1.71	410
Westly Stauffer	8275		Nov. 17	15.1	14.3	63.8	8.8	1.71	300
Jas. Bell	8276		Nov. 17	13.3	12.6	61.9	6.4	2.07	450
Average				13.1	12.4	71.9	11.2	1.39	625
Clinton County.									
John Betts	8273		Nov. 17	19.1	18.1	78.9	14.7	1.30	430
Decatur County.									
G. W. Snyder	7362	Klein Wanzlebener	Sept. 18	5.6	5.3	58.9	4.8	1.17	1840
Grant County.									
H. D. Thomas	7734	Klein Wanzlebener	Oct. 8	9.8	9.3	73.7	9.9	.99	675
Do	7735	Imperial	Oct. 8	9.3	8.8	70.8	7.3	1.28	583
Do	7736	Florimond Desprez	Oct. 8	8.3	7.9	68.0	6.5	1.27	665
Snead Thomas	8449		Dec. 5	9.6	9.1	72.2	9.3	1 03	695
Do	8450	Imperial	Dec. 5	8.2	7.8	66.7	6.1	1.35	885
Average				9.0	8.6	70.3	7.8	1.18	701
Green County.									
L. D. Maddux	8152	Klein Wanzlebener	Nov. 6	15.4	14.6		12.7	1.21	220
Do	8153	Lemaire's Improved	Nov. 6	12.7	12.1	77.9	10.9	1.17	385
Average				14.1	13.4	77.9	11.8	1.19	303
Hamilton County.									
A. Smith	8283		Nov. 19	10.3	9.8	72.5	7.6	1.35	605
Ira W. Christian	8421		Nov. 24	11.1	10.5	66.9	6.3	1.75	407
Average				10.7	10.2	69.7	7.0	1.55	506
Hancock County.									
S. Caroway	7371	Legrand White Impr.	Sept. 22	11.1	10.5	75.4	12.3	0.90	445
Do	7372	Klein Wanzlebener	Sept. 22	3.5	3.3	28.2	3.2	1.08	990
Average				7.3	6.9	51.8	7.8	0.99	718
Henry County.									
P. Hayse	8123		Nov. 3	11.2	10.6	82.6	11.2	1.00	780

INDIANA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Howard County.				P. ct.	P. ct.			P. ct.	Gr'ms.
Dr. T. Baldwin	8277		Nov. 17	13.9	13.2	70.5	8.8	1.57	600
Marion County.									
J. H. Bradford	7782	Florimond Desprez	Oct. 10	6.4	6.1	60.3	4.4	1.44	940
Do	7783	Klein Wanzlebener	Oct. 10	9.8	9.3	72.1	9.0	1.09	935
J. V. Carter	7933	Lemaire	Oct. 20	8.1	7.7	64.3	6.4	1.26	565
Do	7934	Klein Wanzlebener	Oct. 20	8.2	7.8	......	5.5	1.48	430
Dr. J. P. Cope	7950	do	Oct. 22	16.2	15.4	......	8.3	1.98	115
Do	7951	Florimond Desprez	Oct. 22	13.5	12.8	......	9.1	1.48	300
Average				10.4	9.8	65.6	7.1	1.46	548
Montgomery County.									
P. S. Kennedy	7740		Oct. 8	7.9	7.5	63.2	7.4	1.07	855
Do	7741		Oct. 8	8.3	7.9	65.6	7.8	1.06	1,050
Average				8.1	7.7	64.4	7.6	1.07	953
Newton County.									
J. E. Watt	7946	White	Oct. 22	10.6	10.1	72.1	8.4	1.26	475
Do	7947	White Rose Heart	Oct. 22	10.4	9.9	71.2	8.3	1.26	610
Average				10.5	10.0	71.7	8.4	1.26	543
Pike County.									
J. T. Brumfield	7370	Klein Wanzlebener	Sept. 22	11.2	10.5	75.7	11.8	0.95	432
Tippecanoe County.									
W. A. Conklin	7919	Lemaire	Oct. 20	8.2	7.8	61.2	6.1	1.35	605
Do	7920	Klein Wanzlebener	Oct. 20	9.3	8.8	67.9	8.6	1.08	600
Average				8.8	8.3	64.6	7.4	1.21	603
White County.									
Wm. Love	7747	White Improved	Oct. 9	7.8	7.4	63.4	6.0	1.31	630
Do	7748	Klein Wanzlebener	Oct. 9	9.4	8.9	65.3	10.0	0.99	250
Z. C. Love	7755	White Improved	Oct. 9	8.8	8.4	61.1	6.4	1.38	750
Average				8.7	8.2	63.3	7.5	1.23	543

IOWA.

Audubon County.									
Mrs. S. Simpson	7909		Oct. 18	11.3	10.7	74.9	8.7	1.30	535
Black Hawk County.									
Bozarth Bros	7770		Oct. 10	12.9	12.3	83.2	13.0	.99	510
Do	7771		Oct. 10	10.8	10.3	74.5	9.6	1.12	740
Do	7772	Klein Wanzlebener	Oct. 10	14.5	13.8	80.1	19.3	.75	550
Do	7773	do	Oct. 10	12.9	12.3	78.6	14.3	.90	605
J. A. Fellers	7774	do	Oct. 10	13.6	12.9	71.5	14.5	.94	440
Do	7775	do	Oct. 10	15.9	15.1	81.5	18.1	.88	625
Average				13.4	12.8	78.2	14.5	.93	578
Carrol County.									
G. Wattles	7898		Oct. 17	14.6	13.9	81.6	15.5	.94	810
Do	7899		Oct. 17	10.9	10.4	67.3	8.1	1.34	985
Henry Silvers	8020	Vilmorin	Oct. 27	12.4	11.8	74.7	10.2	1.21	640
August Bohme	8021	do	Oct. 27	15.5	14.7	85.2	14.4	1.08	213
Daniel Cooper	8078	do	Oct. 30	12.7	12.1	73.4	10.1	1.26	265
Average				13.2	12.6	76.4	11.7	1.17	583

IOWA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Cherokee County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
F. M. Langley	7692	Klein Wanzlebener	Oct. 6	9.7	9.2	63.4	6.4	1.52	440
Do	7693	do	Oct. 6	12.1	11.5	72.9	9.9	1.22	507
Average				10.9	10.4	68.2	8.2	1.57	474
Fayette County.									
J. W. Yeaden	7602	Klein Wanzlebener	Sept. 25	10.4	9.9	71.7	9.3	1.12	752
G. W. Kiple	7605	do	Sept. 25	13.3	12.6	79.6	12.9	1.03	747
Average				11.9	11.3	75.7	11.1	1.08	750
Harrison County.									
R. Yeisley & Son	7642		Sept. 30	13.9	13.2	79.4	11.4	1.22	1,002
Do	7737		Oct. 8	8.8	8.4	66.7	5.6	1.57	1,027
Average				11.4	10.8	73.1	8.5	1.40	1,013
Page County.									
J. A. Johnson	7954	Brabant	Oct. 23	11.7	11.1	72.6	11.8	.99	668
Polk County.									
H. Wendt	8270	Florimond Desprez	Nov. 17	6.1	5.8	56.0	3.7	1.66	430
Do	8271	Klein Wanzlebener	Nov. 17	10.7	10.2	......	7.7	1.39	280
Average				8.4	8.0	56.0	5.7	1.53	355
Sioux County.									
N. G. O. Coad	7703		Oct. 6	12.4	11.8	71.7	8.1	1.50	298
Do	7704		Oct. 6	10.7	10.2	69.0	7.3	1.47	1,045
John Cornforth	8016		Oct. 27	13.6	12.9	77.3	10.1	1.35	1,020
Average				12.2	11.6	72.7	8.5	1.44	788
Webster County.									
R. Hoff	7892	Vilmorin	Oct. 16	15.9	15.1	95.2	18.3	.81	320
Do	8172	do	Nov. 8	18.1	17.2	87.5	23.5	.77	220
Do	8173	do	Nov. 8	17.6	16.7	91.1	25.9	.68	520
Do	8174	do	Nov. 8	8.7	8.3	65.4	6.4	1.35	1,180
Average				15.1	14.4	84.8	18.5	.90	560
Woodbury County.									
Mrs. H. A. Mercer	7638	Klein Wanzlebener	Sept. 29	10.0	9.5	68.5	7.7	1.30	665
Do	7639	Vilmorin	Sept. 29	10.4	9.9	65.4	6.8	1.53	590
Average				10.2	9.7	67.0	7.3	1.42	628

KANSAS.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Barber County.									
W. H. Fleming	8432		Dec. 1	14.6	13.9	81.1	11.2	1.03	259
O. Coyle	8433		Dec. 1	17.8	16 9	84.8	17.3	1.03	140
Allan W. Smith	8434		Dec. 1	14.1	13.4	74.2	11.7	1.21	690
Average				15.5	14.7	80.0	14.4	1.09	363
Bourbon County.									
Wm. Lehman	8106	German beet	Nov. 3	6.5	6.2	61.3	4.5	1.44	1,645
Do	8107	American beet	Nov. 3	9.5	9.0	72.0	7.9	1.21	1,925
J. C. Hart	8160	White Vilmorin	Nov. 7	13.5	12.8	86.6	13.6	.99	640
Average				9.8	9.3	73.3	8.7	1.21	1,403

KANSAS—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Butler County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
L. R. Smith	7879	Florimond Desprez	Oct. 15	10.2	9.7	70.5	8.4	1.21	685
Lyon County.									
Sen. P. B. Plumb	7385		Sept. 24	4.9	4.7	50.0	3.3	1.50	2,130
Do	7386		Sept. 24	4.2	4.0	51.2	3.1	1.35	2,695
Average				4.6	4.4	50.6	3.2	1.43	2,423
Clay County.									
Mrs. C. W. Blacklund	7722	Klein Wanzlebener	Oct. 6	10.9	10.4	......	7.1	1.53	162
Do	7723	Florimond Desprez	Oct. 6	9.5	9.0	70.3	6.5	1.46	232
E. B. Marian	7780	....do	Oct. 10	8.5	8.1	64.8	6.3	1.36	1,010
Do	7781	Simon Legrand	Oct. 10	10.4	9.9	68.0	7.2	1.44	1,040
Average				9.8	9.3	67.6	6.8	1.45	611
Douglas County.									
S. D. Coffin	8423	Klein Wanzlebener	Nov. 25	8.5	8.1	65.3	5.2	1.62	1,385
Do	8424	....do	Nov. 25	9.2	8.7	64.8	5.3	1.75	965
Average				8.9	8.4	65.1	5.3	1.68	1,175
Hamilton County.									
A. L. Bandy	8041	Klein Wanzlebener	Oct. 28	15.7	14.9	82.2	13.8	1.12	720
Do	8042	Florimond Desprez	Oct. 28	10.9	10.4	71.3	7.8	1.39	780
Average				13.3	12.6	76.8	10.8	1.26	750
Johnson County.									
Geo. B. Lord	7810	Klein Wanzlebener	Oct. 13	9.3	8.8	68.4	7.1	1.31	410
Do	7811	Vilmorin	Oct. 13	16.8	16.0	......	12.2	1.38	180
Average				13.05	12.4	68.4	9.7	1.35	295
Saline County.									
Ed. Latz	7666	Klein Wanzlebener	Oct. 3	8.4	8.0	65.6	8.6	1.28	930
Do	7667	Florimond Desprez	Oct. 3	8.2	7.8	60.7	8.1	1.01	847
Average				8.3	7.9	63.2	8.4	1.15	889
Stafford County.									
S. A. Marteeny	7815	Klein Wanzlebener	Oct. 13	12.1	11.5	75.2	10.0	1.20	548

MARYLAND.

Prince George's County.									
Maryland Agricultural Experiment Station.	7882	Vilmorin	Oct. 16	12.3	11.7	82.0	15.2	.81	435
Do	7883	Simon Legrand White Improved.	Oct. 16	14.2	13.5	88.2	16.5	.86	480
Do	7884	Bulteau Desprez Richest.	Oct. 16	8.6	8.2	72.3	7.7	1.12	413
Do	7885	Florimond Desprez Richest.	Oct. 16	8.3	7.9	74.1	8.7	.95	433
Do	7886	Klein Wanzlebener	Oct. 16	10.8	10.3	81.8	10.9	.99	445
Do	7984	Vilmorin	Oct. 25	10.4	9.9	77.0	9.6	1.08	265
Do	7985	Simon Legrand White Improved.	Oct. 25	7.9	7.5	70.2	7.3	1.08	355
Do	7986	Bulteau Desprez Richest.	Oct. 25	10.2	9.7	75.6	9.6	1.08	335
Do	7987	Florimond	Oct. 25	11.1	10.6	82.2	12.9	.86	425

MARYLAND—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Prince George's County—Continued.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
Maryland Agricultural Experiment Station.	7988	Klein Wanzlebener ...	Oct. 25	9.3	8.8	73.8	9.4	.99	540
Do	8057	Dippe's Vilmorin	Oct. 29	15.9	15.1	90.4	19.6	.81	383
Do	80 8	Simon Legrand White Improved.	Oct. 29	13.2	12.5	82.5	11.5	1.17	300
Do	8059	Bulteau Desprez Richest.	Oct. 29	8.6	8.2	73.5	8.0	1,08	580
Do	8060	Florimond Desprez Richest.	Oct. 29	10.0	9.5	76.9	8.9	1.12	320
Do	8061	Klein Wanzlebener ..	Oct. 20	11.1	10.6	78.2	10.5	.99	380
Do	8097	Dippe's Vilmorin	Nov. 1	10.5	10.0	69.0	6.9	1.53	330
Do	8098	Simon Legrand White Improved.	Nov. 1	12.5	11.9	86.8	12.1	1.03	320
Do	8099	Bulteau Desprez Richest.	Nov. 1	10.5	10.0	77.8	9.7	1.08	435
Do	8100	Florimond Desprez Richest.	Nov. 1	8.3	7.9	66.9	7.7	1.08	335
Do	8101	Klein Wanzlebener ...	Nov. 1	13.3	12.6	......	13.4	.99	168
Do	8140	Dippe's Vilmorin	Nov. 5	14.6	13.9	.....	21.5	.68	155
Do	8141	Simon Legrand White Improved.	Nov. 5	14,5	13.8	......	24.6	.59	195
Do	8142	Bulteau Desprez Richest.	Nov. 5	12.7	12.1	......	16.5	.77	153
Do	8143	Florimond Desprez Richest.	Nov. 5	12.6	12.0	......	18.5	.68	163
Do	8144	Klein Wanzlebener ...	Nov. 5	13.2	12.5	.....	16.3	.81	140
Do	8161	Dippe's Vilmorin	Nov. 7	13.2	12.5	84.6	18.3	.72	198
Do	8162	Simon Legrand White Improved.	Nov. 7	13.6	12.9	81.4	18.9	.72	170
Do	8163	Bulteau Desprez Richest.	Nov. 7	11.5	10.9	82.2	13.4	.86	137
Do	8164	Florimond Desprez Richest.	Nov. 7	12.5	11.9	82.3	17.4	.72	183
Do	8165	Klein Wanzlebener ...	Nov. 7	13.4	12.7	......	15.6	.86	120
Do	8200	Dippe's Vilmorin	Nov. 12	15.4	14.6	....	26.1	.59	170
Do	8201	Simon Legrand White Improved.	Nov. 12	14.1	13.4	......	19.6	.72	135
Do	8202	Bulteau Desprez Richest.	Nov. 12	12.6	12.0	......	15.6	.81	136
Do	8203	Florimond Desprez Richest.	Nov. 12	14.9	14.2	......	23.6	.63	103
Do	8204	Klein Wanzlebener ...	Nov. 12	13.3	12.6	.....	18.5	.72	173
Do	8224	Vilmorin	Nov. 15	13.1	12.5	80.8	12.8	1.08	605
Do	8225	Simon Legrand White Improved.	Nov. 15	11.0	10.5	78.0	9.8	1.12	760
Do	8226	Bulteau Desprez Richest.	Nov. 15	10,4	9.4	76.5	8.6	1.21	830
Do	8227	Florimond Desprez Richest.	Nov. 15	9.8	9.3	74.8	10.3	.95	645
Do	8228	Klein Wanzlebener ...	Nov. 15	10.7	10.2	76.5	11.4	.94	370
Do	8229	Dippe's Vilmorin	Nov. 15	15.1	14.4	83.9	15.9	.95	385
Do	8230	Simon Legrand White Improved.	Nov. 15	14.9	14.2	83.2	16.4	.90	285
Do	8231	Bulteau Desprez Richest.	Nov. 15	13.7	13.0	82.5	14.4	.95	275
Do	8232	Florimond Desprez Richest.	Nov. 15	7.9	7.5	69.9	8.8	.90	530
Do	8233	Klein Wanzlebener ...	Nov. 15	12.1	11.5	78.6	10.8	1.12	255
Do	8234	Dippe's Vilmorin	Nov. 15	13.4	12.7	84.3	16.5	.81	320
Do	8235	Simon Legrand White Improved.	Nov. 15	14.3	13.6	80.8	15.0	.95	122
Do	8236	Bulteau Desprez Richest.	Nov. 15	12.1	11.5	82.3	14.1	.86	163
Do	8237	Florimond Desprez Richest.	Nov. 15	11.0	10.5	......	15.3	.72	125
Do	8238	Klein Wanzlebener ...	Nov. 15	14.9	14.2	......	19.4	.77	100
Do	8239	Dippe's Vilmorin	Nov. 15	13.0	12.4	83.3	14.4	.90	450
Do	8240	Simon Legrand White Improved.	Nov. 15	9.9	9.4	75.6	11.1	.90	305
Do	8241	Bulteau Desprez Richest.	Nov. 15	12.2	11.6	75.8	10.4	1.17	390

MARYLAND—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Prince George's County—Continued.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
Maryland Agricultural Experiment Station.	8242	Florimond Desprez Richest.	Nov. 15	10.9	10.4	76.3	11.0	.99	335
Do	8243	Klein Wanzlebener	Nov. 15	13.1	12.5	84.0	12.7	1.03	305
Do	8244	Dippe's Vilmorin	Nov. 15	14.0	13.3	90.3	19.4	.72	145
Do	8245	Simon Legrand White Improved.	Nov. 15	14.2	13.5	......	19.7	.72	155
Do	8246	Bulteau Desprez Richest.	Nov. 15	11.4	10.8	87.7	18.1	.63	350
Do	8247	Florimond Desprez Richest.	Nov. 15	11.2	10.6	80.0	14.5	.77	205
Do	8248	Klein Wanzlebener	Nov. 15	13.2	12.5	......	17.1	.77	125
Do	8249	Vilmorin	Nov. 15	15.4	14.6	82.8	24.4	.63	555
Do	8250	Simon Legrand White Improved.	Nov. 15	12.6	12.0	77.8	12.7	.99	380
Do	8251	Bulteau Desprez Richest.	Nov. 15	13.7	13.0	81.1	17.8	.77	240
Do	8252	Florimond Desprez Richest.	Nov. 15	11.8	11.2	79.2	12.4	.95	220
Do	8253	Klein Wanzlebener	Nov. 15	12.3	11.7	78.4	15.2	.81	345
Do	8254	Dippe's Vilmorin	Nov. 15	15.1	14.4	86.3	19.6	.77	245
Do	8255	Simon Legrand White Improved.	Nov. 15	12.7	12.1	76.9	14.1	.90	260
Do	8256	Bulteau Desprez Richest.	Nov. 15	11.4	10.8	75.5	9.7	1.17	460
Do	8257	Florimond Desprez Richest.	Nov. 15	8.0	7.6	68.4	7.4	1.08	445
Do	8258	Klein Wanzlebener	Nov. 15	12.9	12.3	76.8	14.4	.90	190
Do	8259	....do	Nov. 15	12.0	11.4	78.4	13.9	.86	200
Do	8260	Florimond Desprez Richest.	Nov. 15	12.2	11.6	73.5	12.3	.99	240
Do	8438	Dippe's Vilmorin	Dec. 4	22.0	21.0	......	34.9	.63	90
Do	8439	Bulteau Desprez Richest.	Dec. 4	18.4	17.5	......	23.9	.77	40
Do	8440	Florimond Desprez	Dec. 4	20.0	19.0	......	27.8	.72	58
Do	8441	Klein Wanzlebener	Dec. 4	19.8	18.8	......	22.0	.90	63
Do	8442	Dippe's Vilmorin	Dec. 4	19.9	18.9	94.8	20.9	.95	375
Do	8443	Simon Legrand White Improved.	Dec. 4	17.6	16.7	91.2	19.6	.90	213
Do	8444	Bulteau Desprez Richest.	Dec. 4	17.8	16.9	84.8	19.8	.90	163
Do	8445	Florimond Desprez Richest.	Dec. 4	13.6	12.9	83.4	12.6	1.08	238
Do	8446	Klein Wanzlebener	Dec. 4	17.4	16.5	......	17.6	.99	125
Average	......	......	......	12.9	12.3	79.7	15.1	.90	416
J. H. Williams	8175	Sugar beet	Nov. 8	10.0	9.5	69.4	8.3	1.21	415
Do	8176	Extra Eclipse	Nov. 8	8.9	8.5	60.1	7.6	1.17	253
Average	......	......	......	9.5	9.0	64.7	8.0	1.19	334

MASSACHUSETTS.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Hampshire County.									
Massachusetts State Experiment Station.	8030	Simon Legrand White Imp.	Oct. 27	11.1	10.6	81.6	13.7	.81	430
Do	8031	Dippe's Vilmorin	Oct. 27	11.8	11.2	80.3	12.4	.95	518
Do	8032	Klein Wanzlebener	Oct. 27	13.3	12.6	86.9	14.9	.90	340
Do	8033	Bulteau Desprez Richest.	Oct. 27	9.8	9.3	80.7	10.3	.95	458
Do	8034	Florimond Desprez	Oct. 27	13.2	12.5	84.7	16.3	.81	595
Average	......	......	......	11.8	11.2	82.8	13.5	.88	468
Suffolk County.									
W. H. Tenney & Co.	8139	......	Nov. 5	16.8	16.0	82.8	17.0	.99	350

MICHIGAN.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Clinton County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
George Archer	7887	Klein Wanzlebener	Oct. 16	12.9	12.3	81.7	15.9	.81	745
Do	7888	Florimond Desprez Richest.	Oct. 16	11.2	10.6	72.7	15.6	.72	780
Average				12.1	11.5	77.2	15.8	.77	763
Eaton County.									
D. J. McCargan	8278	Florimond Desprez	Nov. 18	9.0	8.6	......	8.7	1.03	167
Do	8279	Klein Wanzlebener	Nov. 18	10.2	9.7	......	10.3	.99	207
Average				9.6	9.1	......	9.5	1.01	187
Gratiot County.									
William Howe	7989	Klein Wanzlebener	Oct. 25	14.6	13.9	......	14.8	.99	550
Do	7990	do	Oct. 25	13.7	13.0	......	12.0	1.17	300
C. Boyd	8212	do	Nov. 14	9.3	8.8	70.5	9.0	1.03	1,750
Do	8213	Simon Legrand	Nov. 14	14.0	13.3	80.9	14.1	.99	1,470
Average				12.9	12.3	75.7	12.5	1.05	1,018
Huron County.									
W. P. Hatheway	7855	Klein Wanzlebener	Oct. 13	11.7	11.1	74.7	9.8	1.20	1.282
Ingham County.									
William Potter	8269	Klein Wanzlebener	Nov. 17	13.1	12.5	76.6	10.3	1.26	1,515
Ionia County.									
Dr. E. J. Howe	7696	Lemaire	Oct. 6	17.7	16.8	84.7	21.6	.82	387
Do	7706	Klein Wanzlebener	Oct. 6	14.2	13.5	81.1	14.2	1.00	443
Average				16.0	15.2	82.9	17.9	.91	415
Lenawee County.									
W. R. Osborn	7902	White Sugar	Oct. 17	8.6	8.2	60.6	8.7	.99	2,475
Do	7903	do	Oct. 17	8.2	7.8	60.3	10.1	.81	1,910
Average				8.4	8.0	60.5	9.4	.90	2,193
Macomb County.									
J. S. Lawson	8047	Klein Wanzlebener	Oct. 29	16.8	16.0	89.8	28.5	.59	680
Do	8048	Simon Legrand	Oct. 29	15.5	14.7	85.2	18.0	.86	705
Average				16.2	15.4	87.5	23.3	.73	693
Muskegon County.									
M. B. Averill	7633	Florimond Desprez	Sept. 29	10.0	9.5	70.4	8.3	1.21	365
Do	7634	Klein Wanzlebener	Sept. 29	14.2	13.4	80.2	14.3	.99	297
Jno. McNitt	7643	do	Oct. 1	13.7	13.0	80.5	17.8	.77	415
Do	7644	Florimond Desprez	Oct. 1	11.8	11.2	80.8	13.7	.86	542
Wm. Hartmann	7676		Oct. 4	12.9	12.3	81.7	11.0	1.17	400
Henry Paulman	7677	Florimond Desprez	Oct. 4	13.8	13.1	85.2	18.7	.74	735
Do	7678	Klein Wanzlebener	Oct. 4	14.3	13.6	85.1	20.1	.71	1,045
Do	7690		Oct. 4	12.7	12.1	83.0	14.6	.87	1,015
Orange Daggett	7971	Florimond Desprez	Oct. 24	9.9	9.4	78.5	10.4	.95	1,450
Do	7972	Klein Wanzlebener	Oct. 24	10.6	10.1	75.7	8.8	1.21	1,070
J. R. Devenport	8284	Russian	Nov. 19	16.4	15.6	89.1	17.2	.95	355
Average				12.8	12.2	80.9	14.1	.95	699
St. Clair County.									
Fritz Sagate	8431		Dec. 1	10.5	99.8	71.5	8.3	1.21	1,660
Saginaw County.									
J. D. Clarke	7999	Klein Wanzlebener	Oct. 25	14.2	13.5	87.1	17.5	.81	720
Do	8112	Florimond Desprez	Nov. 3	12.9	12.3	76.8	11.9	1.08	825
Average				13.6	12.9	82.0	14.7	.95	773

MINNESOTA.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Anoka County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
John Hunter	7658		Oct. 2	12.3	11.7	75.5	10.1	1.19	440
Do	7659		Oct. 2	15.9	15.1	84.1	17.2	.93	680
S. Barstow	7705		Oct. 6	14.9	14.2	85.0	16.4	.91	735
John Hunter	7707		Oct. 6	16.3	15.5	82.3	18.3	89	387
L. J. Carpenter	7708		Oct. 6	12.0	11.3	76.4	11.3	1.06	607
F. A. Edgerton	7712	Klein Wanzlebener	Oct. 6	14.1	13.4	77.0	16.6	.85	407
A. J. Smith	7715		Oct. 6	13.5	12.9	76.2	14.5	.93	750
S. A. Farrington	7716		Oct. 6	10.5	10.0	63.6	7.2	1.45	617
Joseph Ridge	7717	Klein Wanzlebener	Oct. 6	10.8	10.3	74.5	10.8	1.14	590
Edward Stack	8006	do	Oct. 27	12.7	12.1	72.6	11.2	1.14	1,160
Average				13.3	12.6	76.72	13.4	1.05	637
Becker County.									
Hans Jagers	8062	Sugar	Oct. 30	15.0	14.3	77.3	11.8	1.26	1,060
Do	8063	do	Oct. 30	13.7	13.0	74.9	12.7	1.08	1,200
Do	8064	French sugar	Oct. 30	9.7	9.2	68.8	6.6	1.48	1,970
Average				12.8	12.2	73.7	10.4	1.27	1,410
Blue Earth County.									
B. W. Sower	7608	Klein Wanzlebener	Sept. 26	13.4	12.7	80.2	13.2	.99	480
Do	7609	Florimond Desprez Richest.	Sept. 26	11.3	10.7	76.8	11.4	.99	500
Do	7610	Klein Wanzlebener	Sept. 26	10.9	10.4	74.1	9.7	1.12	587
F. W. Lossow	7629	Florimond Desprez	Sept. 29	7.9	7.6	60.3	6 5	1.21	1,135
Do	7630	Lemaire Richest	Sept. 29	11.4	10.8	77.6	11.1	1.03	955
Chas. Bennett	7649	do	Oct. 10	11.5	10.9	73.2	9.0	1.28	523
Do	7650	Florimond Desprez	Oct. 10	10.6	10.1	74.1	9.6	1.11	693
Gilbert Guttersen	7918		Oct. 18	11.1	10.6	76.1	12.3	.90	500
Average				11.0	10.5	74.1	10.4	1.08	684
Brown County.									
Herman Pfaender	7660	Florimond Desprez	Oct. 3	7.7	7.4	66.4	7.3	1.06	1,370
Do	7665	Klein Wanzlebener	Oct. 3	10.1	9.5	69.7	7.8	1.29	945
Average				8.9	8.5	68.1	7.6	1.18	1,158
Carver County.									
Leonhard Ziermann	7753	Klein Wanzlebener	Oct. 9	15.8	15.0	81.0	15.2	1.04	503
Do	7754	Florimond Desprez	Oct. 9	13.2	12.5	77.5	12.7	1.04	642
G. Teubert	7968	Bohemian	Oct. 24	9.2	8.7	65.7	6.4	1.44	1,640
Do	7969		Oct. 24	8.2	7.8	60.0	4.8	1.71	1,020
Average				11.6	11.0	71.1	9.8	1.31	951
Chisago County.									
Eric Jonason	7631	Klein Wanzlebener	Sept. 29	12.2	11.6	75.3	10.4	1.17	680
Do	7632	Florimond Desprez	Sept. 29	15.1	14.4	79.5	14.0	1.08	495
L. J. Stark	7866		Oct. 14	13.8	13.1	80.2	15.2	.91	650
Do	7867		Oct. 14	12.7	12.1	80.9	9.8	1.30	1,265
L. O. Tombler	7983		Oct. 24	13.9	13.2	83.7	15.4	.90	1,525
Average				13.5	12.9	79.9	12.9	1.07	923
Clay County.									
C. B. Kittredge	8205	Klein Wanzlebener	Nov. 12	13.6	12.9	73.9	9.1	1.48	865
Do	8430		Dec. 1	13.7	13.0	76.5	13.3	1.03	665
Average				13.7	13.0	75.2	11.2	1.26	765
Cottonwood County.									
Simon Huntington	8007	Florimond Desprez	Oct. 27	15.6	14.8	72.9	10.8	1.44	675
Do	8008	do	Oct. 27	10.3	9.8	62.4	5.9	1.75	1,120
Average				13.0	12.3	67.7	8.4	1.60	898

MINNESOTA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Dakota County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
H. W. Koch	8110	German sugar	Nov. 3	16.7	15.9	84.4	14.3	1.17	400
Do	8111	French sugar	Nov. 3	14.0	13.3	77.8	9.0	1.44	333
Average				15.3	14.6	81.1	11.6	1.31	367
Faribault County.									
C. H. Culver	8459		Dec. 6	9.6	9.1	66.2	6.3	1.53	880
Do	8460		Dec. 6	10.9	10.4	63.0	5.2	2.11	865
Average				10.3	9.8	64.6	5.8	1.82	873
Fillmore County.									
Dr. C. H. Robbins	7812	Simon Legrand	Oct. 13	9.7	9.2	56.0	5.9	1.64	1,262
D. J. Tew	8114	Brabant	Nov. 3	14.2	13.7	83.2	15.2	.95	390
Average				12.0	11.4	74.6	10.5	1.30	826
Goodhue County.									
Edward A. Donnell	7788	Klein Wanzlebener	Oct. 11	16.9	16.1	86.7	18.2	.93	447
William Hagman	8125	White sugar	Nov. 4	8.2	7.8	63.1	5.5	1.48	1,025
J. G. Stearns.	8188	Klein Wanzlebener	Nov. 10	10.5	10.0	75.6	9.0	1.17	930
George W. Judd	8189	do	Nov. 10	8.9	8.5	63.6	7.4	1.25	815
Mrs. James Guero	8190	do	Nov. 10	11.7	11.1	64.4	7.9	1.48	390
R. P. Thacher	8416	do	Nov. 24	12.7	12.1	73.4	7.8	1.62	520
Average				11.5	10.9	71.1	9.3	1.32	685
Hennepin County.									
Olaf Johnson	7948		Oct. 22	14.7	14.0	92.5	14.9	.99	780
Hans Burlingame	7949		Oct. 22	12.5	11.9	69.4	8.2	1.53	940
George Dawthwaite	8132	Klein Wanzlebener	Nov. 4	9.4	8.9	68.6	7.5	1.26	1,560
Do	8133	Florimond Desprez	Nov. 4	9.7	9.2	69.8	7.5	1.30	576
Peter Weinand	8151		Nov. 6	16.5	15.7	79.3	15.3	1.08	817
William H. Loverin	8171	Klein Wanzlebener	Nov. 8	15.6	14.8	87.2	15.8	.99	600
Average				13.1	12.4	77.8	11.5	1.19	1,216
Houston County.									
Herman Pederson	7620	Klein Wanzlebener	Sept. 20	13.7	13.0	80.6	12.7	1.08	510
Isante County.									
Gaulbey & Anderson.	8196		Nov. 11	10.9	10.4	67.9	8.7	1.26	1,445
N. A. Ahlstrom	7790	Klein Wanzlebener	Oct. 11	9.8	9.3	68.0	6.6	1.48	1,925
Do	7791	Simon Legrand	Oct. 11	10.8	10.3	75.5	8.9	1.24	1,500
Average				10.5	10.0	70.5	8.1	1.33	1,623
Le Sueur County.									
J. C. Swain	7798		Oct. 11	11.8	11.2	74.2	8.8	1.34	500
Do	7799		Oct. 11	11.0	10.5	71.9	13.6	.81	515
Average				11.4	10.8	73.2	11.2	1.08	508
Lincoln County.									
A. J. Crain	8104	Klein Wanzlebener	Nov. 3	13.2	12.5	73.7	10.9	1.21	1,513
Do	8105	Florimond Desprez Richest.	Nov. 3	12.7	12.1	72.6	9.8	1.30	1,173
Average				13.0	12.3	73.2	10.4	1.26	1,343
Lyon County.									
Andrew De Sutter	8126	Klein Wanzlebener	Nov. 4	13.7	13.0	72.5	9.7	1.44	500
Do	81-7		Nov. 4	17.6	16.7	83.8	11.5	1.53	480
Average				15.7	14.9	78.2	10.6	1.49	490

MINNESOTA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
McLeod County.									
				P. ct.	P. ct.			P. ct.	Gr'ms.
Daniel Devitt	7651	Florimond Desprez Richest.	Oct. 2	10.0	9.5	69.4	7.5	1.34	1,090
Do	7652	Klein Wanzlebener	Oct. 2	13.0	12.3	77.9	12.7	1.02	795
Average				11.5	10.9	73.7	10.1	1.18	943
Marshal County.									
N. Bjorge	7657	Klein Wanzlebener	Oct. 2	8.9	8.5	66.9	6.5	1.37	740
Martin County.									
William H. Budd	7877	Klein Wanzlebener	Oct. 15	15.0	14.3	85.2	13.9	1.08	730
Do	7878	Florimond Desprez	Oct. 15	10.3	9.8	70.5	7.9	1.30	735
Nelson Bouse	7959	Klein Wanzlebener	Oct. 23	12.9	12.3	76.4	9.6	1.35	725
Do	7960	Florimond Desprez	Oct. 23	9.0	8.6	64.3	15.4	1.39	620
Henry Anderman	7963		Oct. 23	12.7	12.1	76.5	10.9	1.17	850
William Suter	8070		Oct. 30	9.0	8.4	64.7	6.5	1.39	1,670
Do	8071		Oct. 30	13.4	12.7	77.0	9.3	1.44	895
Average				11.8	11.2	73.5	10.5	1.30	889
Meeker County.									
E. Evenson	7768	Lemaire	Oct. 10	11.1	10.6	74.0	9.0	1.24	515
Do	7769	Florimond Desprez	Oct. 10	12.0	11.4	75.9	10.4	1.15	535
Average				11.6	11.0	75.0	9.7	1.15	525
Murray County.									
George B. Stiles	8076		Oct. 30	13.3	12.4	86.1	12.0	1.08	600
Do	8077		Oct. 30	12.6	12.0	84.6	11.3	1.12	440
V. H. Maxwell	8208		Nov. 14	18.6	17.7	84.3	19.6	.95	279
James Taylor	8209		Nov. 14	18.7	17.8	82.4	18.2	1.03	280
Do	8218		Nov. 14	17.1	16.3	84.7	17.3	.99	475
Average				16.1	15.2	84.4	15.7	1.03	415
Nicolet County.									
Fritz Virth	7955		Oct. 23	13.7	13.0	75.6	9.3	1.48	612
Noble County.									
J. P. Moulton	8092	White	Nov. 1	13.8	13.1	76.2	11.4	1.21	1,060
Do	8093		Nov. 1	13.7	13.0	76.6	12.2	1.12	1,475
Average				13.8	13.1	76.4	11.8	1.17	1,268
Pipestone County.									
J. J. Barnard	8094	Holland	Nov. 1	10.3	9.8	67.4	7.6	1.35	933
Do	8095		Nov. 1	12.9	12.3	74.6	10.2	1.26	1,375
Average				11.6	11.0	71.0	8.9	1.31	1,154
Ramsey County.									
Minnesota Experiment Station.	8287	Klein Wanzlebener	Nov. 20	11.2	10.6	81.8	13.8	.81	783
Do	8288	Bulteau Desprez Richest.	Nov. 20	10.8	10.3	77.1	12.0	.90	900
Do	8289	Simon Legrand White Improved.	Nov. 20	10.9	10.4	74.2	14.2	.77	653
Do	8290	Dippe's Vilmorin	Nov. 20	12.9	12.3	89.6	19.0	.68	873
Do	8291	Florimond Desprez	Nov. 20	9.4	8.7	83.2	12.2	.77	1,035
Do	8292	Vilmorin Sugar	Nov. 20	10.8	10.3	77.7	12.6	.86	635
Do	8293	White Sugar, Gregory	Nov. 20	10.1	9.6	83.4	12.5	.81	770
Do	8294	Improved Imperial	Nov. 20	8.0	7.6	74.8	9.3	.86	1,185
Do	8295	Excelsior Sugar	Nov. 20	11.3	10.7	82.7	12.6	.90	805
Do	8296	Lane's Gregory	Nov. 20	8.5	8.1	......	7.9	.08	650
Do	8297	Lane's Improved Sugar	Nov. 20	9.9	9.4	80.5	10.4	.95	870
Do	8298	Vilmorin White Imp.	Nov. 20	9.7	9.2	86.1	10.2	.95	796
Average				11.1	10.6	81.0	12.2	.83	830

MINNESOTA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Rock County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
J. F. Shoemaker	8150	Klein Wanzlebener	Nov. 6	14.2	13.5	79.3	12.7	1.12	870
Steele County.									
Clark Chambers	8027	Florimond Desprez	Oct. 27	8.5	8.1	60.3	7.6	1.12	1,230
Do	8272	do	Nov. 17	11.0	10.5	74.8	8.7	1.26	855
Average				9.8	9.3	67.6	8.2	1.19	1,043
Travers County.									
H. C. Bartlet	8102	German Legrand	Nov. 3	18.3	17.4	79.2	14.1	1.30	840
Do	8103	do	Nov. 3	17.5	16.6	73.3	14.6	1.21	575
Average				17.9	17.0	76.3	14.4	1.26	708
Wabash County.									
John Ween	7641	Florimond Desprez	Sept. 29	10.3	9.8	71.0	7.1	1.44	280
Washington County.									
Roger S. McIntosh	8018	Florimond Desprez	Oct. 27	11.3	10.7	79.5	10.7	1.08	810
Do	8019	Klein Wanzlebener	Oct. 27	13.6	12.9	80.5	13.5	1.03	710
Henry B. Vollner	8169	French Beet	Nov. 7	11.7	11.1	69.2	7.7	1.53	1,790
Average				11.2	10.6	76.4	10.6	1.21	1103
Wilkins County.									
Robt. Glover	7606	Dutch	Sept. 24	15.4	14.6	80.6	15.6	.99	447
Wright County.									
C. W. Judson	7967	Klein Wanzlebener	Oct. 24	10.5	10.0	71.4	8.1	1.30	910
County unknown.									
Henry Hillesheim	8437		Dec. 2	6.6	6.3	61.7	4.6	1.44	2,053

MISSOURI.

Bates County.									
Jacob Blocher	7900	White Silesian	Oct. 17	9.1	8.7	66.9	8.4	1.08	500
Do	7901	French Sugar	Oct. 17	8.4	8.0	66.7	7.8	1.08	700
Average				8.8	8.4	66.7	8.2	1.08	600

NEBRASKA.

Antelope County.									
F. H. Trowbridge	7366		Sept. 22	16.1	15.3	82.1	16.9	.95	241
Do	7367		Sept. 22	15.9	15.0	81.5	16.7	.95	226
Do	7368		Sept. 22	16.6	15.8	88.8	16.1	1.03	176
Do	7369		Sept. 22	18.8	17.9	81.8	18.3	1.03	119
C. A. Hathaway	7672	Florimond Desprez Richest.	Oct. 4	13.1	12.4	75.2	9.8	1.34	455
Do	7673	Klein Wanzlebener	Oct. 4	14.1	13.4		9.0	1.55	200
Do	7674	Florimond Desprez Richest.	Oct. 4	10.3	9.8	70.9	7.6	1.36	885
Do	7675	Klein Wanzlebener	Oct. 4	16.0	15.3		13.6	1.18	265
E. L. Heneway	7697	do	Oct. 6	14.3	13.4	77.3	11.1	1.29	755
Do	7698	Florimond Desprez	Oct. 6	12.2	11.6	77.7	10.3	1.18	410
N. Cosby	7725		Oct. 7	13.3	12.6	70.4	12.2	1.09	250
Do	7729	Improved White	Oct. 7	9.0	8.6	72.0	8.4	1.07	382

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Antelope County—Continued.				P. ct.	P. ct.			P. ct.	Gr'ms.
C. E. Heneway	7732	Klein Wanzlebener	Oct. 8	7.9	7.5	63.4	4.8	1.64	920
Do	7733	Florimond Desprez	Oct. 8	9.2	8.7	65.3	6.4	1.45	540
C. M. Wyman	7742	Klein Wanzlebener	Oct. 8	10.9	10.4	65.7	7.0	1.56	440
Do	7743	Florimond Desprez	Oct. 8	12.1	11.5	65.7	5.3	2.28	430
James Lewelan	7751		Oct. 9	10.6	10.1	50.2	7.8	1.36	357
Do	7752		Oct. 9	10.9	10.4		8.8	1.24	170
George Brokaw	7863		Oct. 14	10.7	10.2	68.2	11.5	.93	491
W. H. Cormeny	7997	Florimond Desprez	Oct. 25	16.5	15.7	86.4	16.7	.99	380
Do	7998		Oct. 25	10.3	9.8	76.8	13.5	1.08	280
Carl Roben	8086		Oct. 31	14.6	13.9	78.1	13.0	1.12	680
Do	8087	Simon Legrand	Oct. 31	13.9	13.2	79.8	12.9	1.08	520
Do	8088	Klein Wanzlebener	Oct. 31	13.6	12.9	80.5	14.3	.95	565
Do	8089	Desprez	Oct. 31	12.5	11.9	73.6	9.0	1.39	490
Do	8090	Lemaire	Oct. 31	14.6	13.9		11.2	1.30	350
Do	8091	Lane's Imperial	Oct. 31	13.1	12.5		9.4	1.39	320
E. Adams	8109	Vilmorin	Nov. 3	16.7	15.9	80.7	10.0	1.67	400
K. C. Edwards	8115		Nov. 3	14.4	13.7	81.4	12.9	1.12	458
Average				13.2	12.5	74.7	10.2	1.26	419
Banner County.									
Wm. Everett	7392	French Beet	Sept. 24	10.8	10.3	66.2	8.3	1.30	710
Do	7393	do	Sept. 24	11.4	10.8	68.3	10.6	1.08	693
Thos. H. Wilson	8026	Vilmorin	Oct. 27	14.0	13.3	76.9	9.7	1.44	435
Average				12.1	11.4	70.4	9.5	1.27	612
Blaine County.									
H. Heitholt	8051	Klein Wanzlebener	Oct. 29	14.6	13.9	78.1	11.6	1.26	610
Do	8052	Florimond Desprez	Oct. 29	11.9	11.3	74.4	9.4	1.26	550
Average				13.3	12.6	76.3	10.5	1.26	580
Boone County.									
C. D. Dean	7819	Desprez	Oct. 13	9.1	8.6	68.6	6.3	1.45	350
Do	7820	Lemaire	Oct. 13	8.1	7.7	65.3	5.5	1.48	435
Anton Ankle	7821	Simon Legrand	Oct. 13	13.3	12.6	72.2	10.3	1.30	685
Do	7822	Lemaire	Oct. 13	13.3	12.6	71.6	12.7	1.05	995
Lewis Leslie	7823		Oct. 13	12.8	12.2	73.6	10.3	1.24	820
Do	7824	Simon Legrand	Oct. 13	11.4	10.8	67.8	10.2	1.12	500
Do	7825	Klein Wanzlebener	Oct. 13	14.3	13.6	88.3	11.7	1.22	820
Do	7826	Desprez	Oct. 13	10.7	10.2		7.8	1.34	515
Do	7827	Lemaire	Oct. 13	10.1	9.6	67.3	6.9	1.46	720
J. B. Green	7828		Oct. 13	7.6	7.2	57.6	4.3	1.77	445
Do	7829	Simon Legrand	Oct. 13	8.8	8.3	62.8	4.9	1.78	545
Do	7830	Klein Wanzlebener	Oct. 13	9.5	9.0	65.9	5.9	1.60	735
J. E. Green	7831	Desprez	Oct. 13	8.7	8.2	65.4	5.3	1.64	485
T. C. Williams	7832		Oct. 13	11.9	11.3		10.8	1.18	225
Do	7833	Simon Legrand	Oct. 13	14.2	13.5		11.5	1.23	340
Do	7834	Klein Wanzlebener	Oct. 13	8.9	8.5	71.2	8.2	1.09	645
Do	7835	Desprez	Oct. 13	8.1	7.7	62.3	4.4	1.86	410
Do	7836	Lemaire	Oct. 13	11.7	11.1	75.0	10.9	1.07	585
G. M. Linard	7837		Oct. 13	10.7	10.2	68.2	10.0	1.07	725
Do	7838	Simon Legrand	Oct. 13	10.3	9.8	66.0	9.0	1.15	765
Do	7839	Klein Wanzlebener	Oct. 13	13.3	12.6	76.8	10.1	1.21	765
Do	7840	Desprez	Oct. 13	11.7	11.1	74.7	15.0	.78	740
Do	7841	Lemaire	Oct. 13	12.0	11.4	81.1	12.0	1.00	640
M. G. Curtis	7842		Oct. 13	12.3	11.7		10.5	1.17	280
Do	7843	Simon Legrand	Oct. 13	13.2	12.5		10.5	1.26	270
Do	7844	Klein Wanzlebener	Oct. 13	10.8	10.4		7.1	1.53	365
Do	7845	Desprez	Oct. 13	12.4	11.8		8.2	1.51	165
H. H. Heward	7846		Oct. 13	11.4	10.8	72.2	8.5	1.34	510
Do	7847	Simon Legrand	Oct. 13	8.8	8.4	62.3	5.9	1.50	590
Do	7848	Klein Wanzlebener	Oct. 13	8.2	7.8	63.5	5.6	1.46	630
Do	7849	Desprez	Oct. 13	9.2	8.7	64.5	12.5	.74	670
Ed. Popper	7850		Oct. 13	9.9	9.4	70.7	8.1	1.23	595
Do	7851	Simon Legrand	Oct. 13	11.4	10.8	76.5	11.5	.99	405
Do	7852	Klein Wanzlebener	Oct. 13	10.1	9.6	71.2	9.0	1.12	455
Do	7853	Desprez	Oct. 13	9.6	9.1	63.2	7.9	1.24	790
Do	7854	Lemaire	Oct. 13	7.0	6.6	62.1	5.1	1.37	620
Average				10.7	10.1	69.2	8.7	1.29	550

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Box Butte County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
A. S. Darling	7746	Vilmorin	Oct. 9	12.9	12.3	72.5	9.3	1.39	825
Do	7765	Klein Wanzlebener	Oct. 10	14.4	13.7	76.2	10.6	1.39	820
P. W. Tracy	7801	....do	Oct. 11	15.0	14.3	68.5	10.0	1.50	407
M. W. Nye	7802	Florimond	Oct. 11	10.3	9.8	69.1	7.4	1.40	513
J. A. Heist	7803	Klein Wanzlebener	Oct. 11	14.7	14.0	69.4	10.1	1.45	650
H. W. Axtell	8009	Klein Wanzlebener, Dippe's.	Oct. 27	9.7	9.2	74.0	8.0	1.21	785
Average				12.8	12.2	71.6	9.2	1.39	666
Brown County.									
W. H. Carey	7868	Desprez	Oct. 10	10.6	10.1	69.7	7.0	1.51	350
Butler County.									
Elizabeth Bales	7668	Lemaire Legrand	Oct. 3	12.6	12.0	68.9	10.9	1.16	260
Do	7669	....do	Oct. 3	14.0	13.3	......	11.8	1.19	230
Average				13.3	12.7	68.9	11.4	1.18	245
Chase County.									
E. J. Ledger	7744		Oct. 8	10.5	10.0	70.5	8.4	1.25	1380
Do	7745		Oct. 8	12.1	11.5	63.5	9.2	1.31	725
Miss D. Vroman	8012	Florimond Desprez, Richest.	Oct. 29	10.0	9.5	66.2	8.3	1.21	860
Do	8013	Klein Wanzlebener	Oct. 29	11.5	10.9	69.7	7.5	1.53	855
Peter Jones	8214	Florimond Desprez	Oct. 29	13.9	13.2	73.5	9.4	1.48	708
Do	8215	Klein Wanzlebener	Oct. 29	13.7	13.0	74.1	9.5	1.44	675
Lizzie Jones	8206	Florimond Desprez	Nov. 14	14.3	13.6	74.9	9.7	1.48	540
Do	8207	Klein Wanzlebener	Nov. 14	13.9	13.2	72.4	7.9	1.75	630
Average				12.4	11.7	70.6	8.7	1.43	796
Cherry County.									
John Benning	7376	Vilmorin	Sept. 24	9.0	8.6	55.2	4.5	2.00	455
Do	7377		Sept. 24	9.7	9.2	65.8	5.2	1.85	605
Average				9.4	8.9	60.5	4.9	1.92	530
Colfax County.									
H. M. Kemp	7880		Oct. 15	10.3	9.8	65.3	6.6	1.57	1,025
Do	7881		Oct. 15	10.9	10.4	70.3	6.9	1.57	850
John Schuldt	8001	Klein Wanzlebener	Oct. 25	13.6	12.9	77.3	11.2	1.21	500
J. B. Martin	8010	Dippe's Vilmorin	Oct. 27	15.4	14.6	81.9	14.3	1.08	523
Do	8011		Oct. 27	13.0	12.4	75.1	10.0	1.30	686
Joseph Praisler	8130	Florimond Desprez	Nov. 4	11.3	10.7	62.4	5.2	2.16	500
Do	8131	Klein Wanzlebener	Nov. 4	12.4	11.8	66.7	7.3	1.71	540
Average				12.4	11.8	71.3	8.8	1.51	661
Cuming County.									
Uriah Brumer	7907	Klein Wanzlebener	Oct. 18	10.8	10.3	67.9	8.3	1.30	475
Do	7908	Florimond Desprez	Oct. 18	10.9	10.4	71.7	8.7	1.26	910
Average				10.9	10.4	69.8	8.5	1.28	692
Custer County.									
W. O. Porter	7663	Vilmorin	Oct. 3	7.9	7.5	60.8	6.0	1.32	565
Do	7664	....do	Oct. 3	8.8	8.4	......	5.4	1.63	305
J. D. Haskell	7679		Oct. 4	7.4	7.0	61.7	5.5	1.35	575
Do	7680		Oct. 4	5.6	5.3	52.3	2.9	1.96	575
Average				7.4	7.0	58.2	5.0	1.56	550
Dawes County.									
R. P. Gregg	7974	Florimond Desprez Richest.	Oct. 24	10.4	9.9	69.3	7.2	1.44	246
Do	7975	Klein Wanzlebener	Oct. 24	16.2	15.4	72.7	8.4	1.93	290
W. J. Hooker	8056	Vilmorin White	Oct. 29	13.7	13.0	77.9	9.5	1.44	340
Average				13.4	12.7	73.3	8.3	1.60	258

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Dawson County.				P. ct.	P. ct.			P. ct.	Gr'ms.
Mrs. Ella Stanley	7927	Klein Wanzlebener	Oct. 20	10. 8	10. 3	69. 7	6. 7	1. 62	840
Do	7928	do	Oct. 20	11. 3	10. 7	76. 9	6. 3	1. 71	500
Average				11. 0	10. 5	73. 3	6. 5	1. 66	670
Deuel County.									
G. W. Hultz	8028	Klein Wanzlebener	Oct. 27	19. 8	18. 8	......	12. 2	1. 62	248
Dodge County.									
E. Morell	7941	Vilmorin	Oct. 21	14. 9	14. 2	81. 4	13. 8	1. 08	750
Chas. Osterman	8124		Nov. 4	16. 3	15. 5	83. 2	15. 8	1. 03	450
Average				15. 6	14. 8	82. 3	14. 8	1. 05	600
Dundy County.									
F. B. Moore	8427	Klein Wanzlebener, Dippe's.	Nov. 28	10. 5	10. 0	67. 7	8. 3	1. 26	1565
Fillmore County.									
J. S. Beardsly	7684		Oct. 4	12. 5	11. 9	73. 1	8. 4	1. 49	990
Do	7685		Oct. 4	11. 2	10. 6	67. 9	6. 8	1. 65	710
Do	7686	Klein Wanzlebener	Oct. 4	13. 5	12. 8	71. 1	8. 4	1. 61	640
Do	7687	Desprez	Oct. 4	12. 1	11. 5	65. 8	6. 1	1. 98	440
Do	7688	Lemaire	Oct. 4	10. 9	10. 4	65. 6	7. 0	1. 55	605
Average				12. 0	11. 6	68. 7	7. 3	1. 66	677
Frontier County.									
A. E. Hill	7856		Oct. 13	9. 8	9. 3	66. 7	7. 5	1. 31	895
Do	7857	Klein Wanzlebener	Oct. 13	12. 9	12. 3	66. 8	11. 3	1. 14	355
Do	7858	Desprez	Oct. 13	12. 0	11. 4	72. 3	9. 5	1. 22	435
G. L. Sherman	7859		Oct. 13	11. 2	10. 6	70. 9	8. 5	1 32	535
Do	7860	Desprez	Oct. 25	17. 1	16. 3	85. 9	16. 4	1. 04	490
W. F. Sherman	7993	Vilmorin Improved	Oct. 25	15. 7	14. 9	81. 3	12. 1	1. 30	350
Do	7994	Klein Wanzlebener	Oct. 25	11. 8	11. 2	76. 6	8. 7	1. 35	660
Average				12. 9	12. 3	74. 4	10. 5	1. 24	531
Furnas County.									
H. Montgomery	7681	Klein Wanzlebener	Oct. 4	12. 0	11. 4	71. 4	7. 7	1. 55	565
Do	7682	Florimond Desprez	Oct. 4	13. 0	12. 4	74. 7	9. 4	1. 39	247
W. B. Keith	7813	Klein Wanzlebener	Oct. 15	14. 7	14. 0	75. 0	11. 0	1. 34	600
Do	7814	Florimond Desprez	Oct. 15	13. 2	12. 5	77. 2	11. 6	1. 14	605
H. Montgomery	7932		Oct. 20	14. 0	13. 3	81. 9	9. 2	1. 53	255
Average				13. 4	12. 7	76. 0	9. 8	1. 39	454
Gage County.									
A. C. Wagner	7387	Klein Wanzlebener	Sept. 24	13. 3	10. 7	79. 0	14. 0	. 81	610
Do	7388	do	Sept. 24	7. 3	6. 9	59. 3	5. 2	1. 40	725
Do	7389	do	Sept. 24	12. 0	11. 4	6. 55	13. 3	. 90	323
M. C. Blake	7702	Florimond Desprez	Oct. 6	8. 1	7. 7	67. 5	6. 6	1. 23	1, 245
E. Arnold	8400	Vilmorin	Nov. 21	10. 7	10. 2	71. 3	8. 2	1. 30	705
Do	8401	Klein Wanzlebener	Nov. 21	10. 0	9. 5	69. 0	7. 7	1. 30	715
Average				9. 9	9. 4	68. 6	9. 2	1. 16	721
Garfield County.									
T. Crane	7699	Florimond	Oct. 6	14. 6	13. 9	......	11. 3	1. 29	260
Do	7700	do	Oct. 6	12. 4	11. 8	......	9. 9	1. 26	265
M. O'Connor	7738	Vilmorin	Oct. 8	17. 6	16. 7	83. 4	13. 7	1. 28	860
Do	7739	do	Oct. 8	13. 4	12. 7	82. 5	11. 7	1. 15	700
M. Crane	7786	Florimond	Oct. 10	9. 8	9. 3	61. 2	6. 3	1. 56	630
A. Phillips	7800		Oct. 11	13. 2	12. 5	72. 0	9. 9	1. 34	483
Average				13. 3	12. 8	74. 8	10. 5	1. 31	533

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
Hall County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
Hans Stodt	7891		Oct. 16	16.4	15.6	90.6	13.5	1.21	448
Fred Suehlsen	7893	German White	Oct. 16	17.5	16.6	87.1	17.7	.99	398
Average				16.9	16.1	88.8	15.6	1.10	423
Hamilton County.									
J. D. Evans	7655		Oct. 2	12.8	12.2	......	9.7	1.32	260
Do	7656		Oct. 2	15.1	14.4	......	13.1	1.15	210
Average				14.0	13.3	......	11.4	1.24	235
Harlan County.									
A. C. Robins	7383	Vilmorin	Sept. 24	12.2	11.6	70.2	9.9	1.25	255
Do	7384	Klein Wanzlebener	Sept. 24	13.1	12.5	71.1	10.5	1.25	160
Aug. Sasse	7904	do	Oct. 17	7.6	7.2	65.0	5.6	1.35	640
Do	7905	do	Oct. 17	11.9	11.3	......	10.6	1.12	255
Average				11.2	10.7	68.8	9.2	1.24	328
Hayes County.									
C. A. Ready	7816		Oct. 13	13.7	13.0	72.0	9.3	1.48	915
Do	7817		Oct. 13	17.3	16.4	79.7	12.5	1.39	590
Do	7818		Oct. 13	13.8	13.1	71.7	8.5	1.62	1,235
Average				14.9	14.2	74.5	10.1	1.49	913
Hitchcock County.									
Anthony Stark	7906	Klein Wanzlebener	Oct. 18	10.7	10.2	67.7	7.0	1.53	715
H. H. Taylor	8044	do	Oct. 28	13.1	12.5	72.0	8.6	1.53	380
Do	8045	Lemaire	Oct. 28	17.7	16.8	76.3	11.3	1.57	413
Do	8046	Desprez	Oct. 28	17.5	16.6	76.1	11.4	1.53	350
Average				14.7	14.0	73.0	9.6	1.54	464
Holt County.									
J. H. Gordon	7394		Sept. 24	9.0	8.6	66.2	7.1	1.26	1,945
Do	7395		Sept. 24	10.5	10.0	70.4	8.1	1.21	2,190
Thos. Wiggins	7694	Vilmorin	Oct. 6	14.1	13.4	75.8	11.3	1.25	600
Do	7695	do	Oct. 6	14.4	13.7	77.0	13.1	1.10	445
E. H. Benedict	7709	Klein Wanzlebener	Oct. 6	13.6	12.9	65.1	9.2	1.48	365
Do	7710	do	Oct. 6	19.8	18.8	......	12.7	1.56	205
Do	7711	do	Oct. 6	18.1	17.2	......	10.7	1.69	187
N. B. Bisbee	7713		Oct. 6	12.1	11.5	71.2	8.3	1.46	680
Do	7714	Vilmorin	Oct. 6	12.3	11.7	74.0	9.0	1.36	515
E. H. Benedict	7718	Florimond Desprez	Oct. 6	14.3	13.5	......	9.9	1.44	545
Do	7719	do	Oct. 6	14.8	13.8	......	6.7	2.23	177
Do	7720	do	Oct. 6	12.1	11.5	68 4	7.7	1.58	460
H. H. Saunders	7864		Oct. 14	12.5	11.9	75.8	10.0	1.23	1,690
Do	7865		Oct. 14	16.1	15.3	79.9	11.3	1.43	1,300
J. Gus. Kluck	7917		Oct. 18	13.1	12.5	80.9	10.8	1.21	860
W. B. Lower	8002	Imported White	Oct. 25	15.1	14.4	81.6	14.7	1.03	670
Edgar Bruner	8197		Nov. 11	20.4	19.4	73.9	10.8	1.89	220
Average				14.2	13.5	73.9	10.1	1.44	777
Howard County.									
C. T. Kenyon	7375	Klein Wanzlebener	Sept. 22	12.5	11.9	79.6	13.2	.95	810
Jefferson County.									
W. W. Watson	7910	Vilmorin	Oct. 18	11.6	11.0	69.5	8.0	1.44	328
Do	7911		Oct. 18	14.9	14.2	79.7	12.7	1.17	408
Do	7912	Lemaire	Oct. 18	12.2	12.6	72.2	9.0	1.35	365
Do	7913	Klein Wanzlebener	Oct. 18	13.1	12.5	74.9	9.4	1.39	450
Do	7914	Florimond Desprez	Oct. 18	9.5	9.1	63.3	6.4	1.48	655
A. Wilson	8414	Desprez	Nov. 24	13.3	12.6	72.3	9.2	1.44	413
J. G. Dougan	8415		Nov. 24	12.1	11.5	74.7	9.3	1.30	420
Average				12.4	11.8	72.4	9.1	1.37	434

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Kearney County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
Gus. Olson	7982	Klein Wanzlebener	Oct. 24	15.6	14.8	76.1	13.3	1.17	214
C. D. Emerson	8447	Lemaire Richest	Dec. 4	22.8	21.7	......	13.7	1.66	155
Do	8448	Klein Wanzlebener	Dec. 4	25.5	24.2	......	14.6	1.75	303
Average	......	......	......	21.3	20.2	76.1	13.9	1.53	224
Kimball County.									
M. Newlngle	7646	White Improved	Oct. 1	11.4	10.8	70.4	7.9	1.44	227
Knox County.									
H. S. Morton	7640	......	Sept. 29	15.3	14.5	81.4	13.1	1.17	595
Carl Schindler	7862	......	Oct. 14	7.8	7.4	62.2	5.9	1.32	2,010
William Benner	7978	Klein Wanzlebener	Oct. 24	10.3	9.8	76.8	7.9	1.30	1,150
William Barnum	7979	...do	Oct. 24	12.9	12.3	68.3	8.4	1.53	485
Do	7980	..do	Oct. 24	10.2	9.7	68.5	9.0	1.35	100
Average	......	......	......	11.3	10.7	71.4	8.9	1.33	868
Lincoln County.									
Caspar Bolish	7358	......	Sept. 5	10.9	10.4	67.4	7.9	1.39	428
G. R. Gullera	7359	......	Sept. 5	12.7	12.1	73.9	12.3	1.04	177
W. S. Hawkins	7360	......	Sept. 5	14.1	13.4	70.5	11.4	1.24	236
Dr. Calvert	7361	Lane's Imperial	Sept. 6	5.8	5.5	60.4	4.9	1.18	980
T. Stimson	7611	Vilmorin	Sept. 26	12.5	11.8	76.7	10.7	1.17	857
C. C. Hawkins	7724	..do	Oct. 7	13.9	13.2	79.4	14.9	.93	680
Do	7726	......	Oct. 7	12.9	12.3	77.2	10.8	1.19	710
J. Whiter	8000	Dippe's Vilmorin	Oct. 25	15.8	15.0	86.8	16.4	.90	930
J. H. Knowles	8268	Klein Wanzlebener	Nov. 17	19.8	18.8	82.8	14.7	1.35	515
Average	......	......	......	13.2	12.5	75.0	11.6	1.15	613
Loup County.									
H. W. Adams	7935	Florimond Desprez, Richest.	Oct. 21	10.5	10.0	67.3	6.0	1.75	675
Do	7936	....do	Oct. 21	9.7	9.2	64.7	5.4	1.75	710
Average	......	......	......	10.1	9.6	66.0	5.7	1.75	692
McPherson County.									
D. P. Wilcox	7976	Klein Wanzlebener, Dippe's.	Oct. 24	11.7	11.1	75.0	11.8	.99	285
Do	7977	Florimond Desprez, Richest.	Oct. 24	14.3	13.6	77.3	11.3	1.26	190
Average	......	......	......	13.0	12.4	76.2	11.6	1.13	238
Madison County.									
D. R. Daniels	7921	Desprez	Oct. 20	10.4	9.9	71.7	8.9	1.17	580
Do	7922	......	Oct. 20	12.2	11.6	70.5	8.0	1.53	800
Do	7923	Vilmorin	Oct. 20	13.2	12.6	73.3	10.5	1.30	1,340
Do	7924	... do	Oct. 20	11.2	10.6	72.7	8.6	1.30	655
T. J. Harter	7930	Klein Wanzlebener	Oct. 20	14.2	13.5	85.5	13.8	1.03	440
Average	......	......	......	12.2	11.6	74.7	10.0	1.26	523
Nuckolls County.									
G. G. Hedgecock	7378	Florimond Desprez, Richest.	Sept. 24	7.3	6.9	58.8	4.8	1.50	393
Do	7379	... do	Sept. 24	10.8	10.3	69.2	9.0	1.20	390
Do	7380	Klein Wanzlebener, Dippe's.	Sept. 24	9.6	9.1	73.3	8.0	1.20	295
Do	7381	....do	Sept. 24	8.2	7.8	68.3	6.6	1.25	320
Average	......	......	......	8.9	8.5	67.4	7.1	1.28	347

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Pawnee County.				P. ct.	P. ct.			P. ct.	Gr'ms.
W. A. Hutchinson	7873	Desprez	Oct. 15	12.5	11.9	79.1	11.2	1.12	1,038
Do	7874	Klein Wanzlebener	Oct. 15	12.4	11.8	79.5	11.5	1.08	768
T. E. Tackley	7937	Legrand	Oct. 21	12.7	12.1	81.9	10.5	1.21	532
Do	7938	Florimond Desprez	Oct. 21	15.6	14.8	83.4	14.5	1.08	432
Average				13.3	12.7	80.5	11.9	1.12	693
Perkins County.									
Miss D. Vroman	7627	Florimond Richest	Sept. 29	10.7	10.2	71.8	7.6	1.40	1,147
Do	7628	do	Sept. 29	9.5	9.0	68.8	7.0	1.35	1,040
C. H. Purinton	7915	Klein Wanzlebener	Oct. 18	16.5	15.7	79.3	12.7	1.30	955
Do	7916	Dippe's Richest	Oct. 18	11.4	10.8	70.8	7.7	1.48	945
Dan Neff	7973	Klein Wanzlebener	Oct. 24	18.0	17.1	90.5	15.4	1.17	630
M. H. Hudson	7653		Oct. 2	12.3	11.7	71.1	9.0	1.54	760
Do	7654	Klein Wanzlebener	Oct. 2	12.3	11.7	72.4	8.0	1.54	520
Average				13.0	12.4	74.9	9.6	1.40	857
Phelps County.									
J. P. Olson	8219		Nov. 14	16.0	15.2	75.8	10.5	1.53	290
Do	8220	Simon Legrand	Nov. 14	12.7	12.1	67.9	6.6	1.94	360
Do	8221	Klein Wanzlebener	Nov. 14	11.9	11.3	66.9	6.2	1.93	490
Do	8222	Desprez	Nov. 14	11.2	10.6	70.4	6.9	1.62	255
Do	8223	Lemaire	Nov. 14	13.7	13.0		9.3	1.48	130
Average				13.1	12.4	70.2	7.9	1.70	305
Pierce County.									
U. S. Forbes	7981		Oct. 24	11.5	10.9	75.2	8.2	1.39	565
Platte County.									
Gerhard Ascke	8183		Nov. 8	12.3	11.7	71.1	8.9	1.39	365
Do	8184	Simon Legrand	Nov. 8	10.1	9.5		6.5	1.53	250
Do	8185	Klein Wanzlebener	Nov. 8	11.2	10.6	69.1	6.4	1.75	520
Do	8186	Lemaire Richest	Nov. 8	8.6	8.2	64.7	5.2	1.66	340
Average				10.6	10.0	68.3	6.8	1.58	369
Polk County.									
J. B. Dey	8003	Dippe's Vilmorin	Oct. 25	8.9	8.5	64.5	5.8	1.53	435
Do	8004	Florimond Desprez	Oct. 25	12.1	11.5	69.5	8.2	1.48	575
Do	8005	Klein Wanzlebener, Dippe's	Oct. 25	13.3	12.6	71.1	8.5	1.57	590
Average				11.4	10.9	68.4	7.5	1.53	533
Red Willow County.									
S. Bolles	7762		Oct. 10	5.3	5.0	48.1	2.6	2.05	1,235
Do	7763	White sugar	Oct. 10	11.9	11.3	74.3	14.5	.82	645
Average				8.6	8.1	61.2	8.6	1.43	940
Richardson County.									
B. Semanton	8145		Nov. 5	12.9	12.3	69.4	9.2	1.39	845
Do	8146	Simon Legrand	Nov. 5	10.9	10.4	66.2	10.6	1.03	630
Do	8147	Klein Wanzlebener	Nov. 5	10.2	9.7	66.2	6.1	1.67	740
Do	8148	Desprez	Nov. 5	7.4	7.0	59.7	5.9	1.26	815
Do	8149	Lemaire	Nov. 5	9.9	9.4	65.6	7.4	1.35	635
Average				10.3	9.8	65.4	7.8	1.34	733
Rock County.									
A. H. Gale	8211	Klein Wanzlebener	Nov. 14	15.2	14.4	83.1	12.1	1.26	400

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Saline County.									
				P. ct.	P. ct.			P. ct.	Gr'ms.
F. J. Foss	8022	Florimond Desprez	Oct. 27	7.4	7.0	56.1	3.9	1.89	375
Do	8023	Klein Wanzlebener	Oct. 27	9.1	8.6	64.1	5.1	1.80	475
Average				8.3	7.8	60.1	4.5	1.85	425
Saunders County.									
W. Meyr	7727	Vilmorin	Oct. 7	11.2	10.6	69.6	4.8	2.34	825
Do	7728	do	Oct. 7	10.8	10.3	74.5	10.3	1.05	730
J. Gabriel	8128		Nov. 4	17.7	16.8		17.2	1.03	305
Do	8129		Nov. 4	15.3	14.5	83.2	14.9	1.03	370
Average				13.8	13.1	75.8	11.8	1.36	5,575
Scott Bluff County.									
William Gauser	8138		Nov. 5	23.9	22.7	83.3	15.6	1.5	333
Seward County.									
E. L. Blanchard	7382		Sept. 24	10.3	9.8	66.0	9.4	1.10	440
W. K. Kelley	7929	Vilmorin	Oct. 20	13.1	12.5	78.5	11.2	1.17	460
Average				11.7	11.2	72.3	10.3	11.4	450
Sheridan County.									
N. J. Cook	7623	Florimond Desprez	Sept. 27	9.3	8.8	68.4	5.7	1.62	455
Do	7624	do	Sept. 27	11.4	10.8	76.0	8.4	1.35	265
S. E. Ferguson	7625	do	Sept. 27	14.7	14.0	77.3	10.2	1.44	485
Do	7626	do	Sept. 27	10.5	10.0	71.4	8.3	1.26	568
C. A. Watterman	8014	Klein Wanzlebener, Dippe's.	Oct. 27	9.2	8.7	68.7	7.3	1.26	663
Do	8015	Florimond Desprez	Oct. 27	8.5	8.1	63.0	6.3	1.35	548
T. A. Fleming	8083		Oct. 31	7.5	7.1	54.7	4.4	1.71	700
Do	8084		Oct. 31	19.6	18.6	78.7	12.5	1.57	500
A. Richardson	8085		Oct. 31	15.8	15.0		10.6	1.53	340
Average				11.8	11.2	69.8	8.2	1.45	503
Thayer County.									
W. B. Hughes	8191		Nov. 10	12.7	12.1	77.5	11.8	1.08	870
Do	8192	Simon Legrand	Nov. 10	14.1	13.4	80.6	15.7	.90	1,060
Do	8193	Klein Wanzlebener	Nov. 10	11.2	10.6	74.2	9.3	1.21	1,595
Do	8194	Desprez	Nov. 10	13.6	12.9	76.4	11.2	1.21	645
Do	8195	Lemaire	Nov. 10	14.2	13.5	84.5	13.2	1.08	1,020
C. E. Ward	8451	Improved White Sugar	Dec. 6	14.6	13.9	66.4	8.5	1.71	315
Do	8452	Desprez	Dec. 6	12.7	12.1	71.8	8.8	1.44	403
Do	8453	Klein Wanzlebener	Dec. 6	16.9	16.1	77.9	12.2	1.39	335
Do	8454	Lemaire	Dec. 6	18.3	17.4	82.1	13.6	1.35	385
Do	8455	Desprez	Dec. 6	17.1	16.2	83.2	13.6	1.26	292
Do	8456	Klein Wanzlebener	Dec. 6	18.2	17.3	84.7	16.9	1.08	323
Do	8457	Lemaire	Dec. 6	14.1	13.4	75.4	9.8	1.44	495
Do	8458	Klein Wanzlebener	Dec. 6	15.9	15.1	76.4	9.5	1.62	500
Average				14.9	14.6	77.8	11.8	1.29	632
Valley County.									
E. W. Waterman	7804	Florimond Desprez	Oct. 11	10.2	9.7	68.9	7.0	1.45	460
Do	7805	Klein Wanzlebener	Oct. 11	12.0	11.4	69.4	8.1	1.48	547
Average				11.2	10.6	69.7	7.6	1.46	503
Wayne County.									
D. W. C. Hood	7621	Dippe's	Sept. 21	9.6	9.1	73.5	7.4	1.30	325
Do	7622	Klein Wanzlebener	Sept. 21	9.4	8.9	68.1	6.0	1.57	500
Average				9.5	9.0	70.8	6.7	1.44	413

NEBRASKA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
York County.				*P. ct.*	*P. ct.*			*P. ct.*	*Gr'ms.*
D. H. Reeder	8065		Oct. 30	9.8	9.3	62.0	7.3	1.35	620
Do	8066	Simon Legrand	Oct. 30	13.9	13.2	73.9	10.3	1.35	450
Do	8067	Klein Wanzlebener	Oct. 30	14.4	13.7	75.8	11.1	1.30	590
Do	8068	Desprez	Oct. 30	14.7	14.0	75.0	13.1	1.12	530
Do	8069	Lemaire	Oct. 30	11.1	10.6	68.9	10.3	1.08	560
Henry Smith	8417		Nov. 24	16.4	15.6	78.5	11.1	1.48	445
Do	8418		Nov. 24	15.4	14.6	......	9.5	1.62	210
Do	8419		Nov. 24	14.6	13.9	72.6	8.8	1.66	230
Do	8420		Nov. 24	12.0	11.4	......	6.9	1.75	350
Average				13.6	12.9	79.4	9.8	1.41	443

NEW YORK.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Genesee County.									
A. D. Lemley	8261	Florimond White Red Top	Nov. 17	10.5	10.0	73.9	9.7	1.08	2,500
Do	8262	Lane's or French Red Top	Nov. 17	15.0	14.3	83.3	18.5	.81	1,210
Do	8263	Vilmorin Red Top	Nov. 17	12.8	12.2	82.1	14.7	.86	1,485
Average				12.8	12.2	79.4	14.3	.92	1,732
Oneida County.									
Henry Branstater	7875	Simon Legrand	Oct. 15	11.9	11.3	78.2	10.6	1.12	400
Do	7876	Florimond Desprez	Oct. 15	11.5	10.9	70.3	11.2	1.03	445
Average				11.7	11.1	78.8	10.9	1.08	423
Warren County.									
F. H. Crumb	8216	Florimond Desprez	Nov. 14	15.3	14.5	87.0	17.0	.90	610
Do	8217	Klein Wanzlebener	Nov. 14	13.8	13.1	81.7	12.8	1.08	675
Average				14.6	13.8	84.5	14.9	.99	643
Yates County.									
Robert Platman	7964	Dippe's Vilmorin	Oct. 24	12.3	11.7	72.4	11.4	1.08	405
Do	7965	Florimond Desprez	Oct. 24	10.7	10.2	67.7	16.1	1.04	465
Do	7966	Simon Legrand	Oct. 24	12.9	12.3	75.0	14.3	.90	540
Average				12.0	11.4	71.7	13.9	10.1	470

NORTH DAKOTA.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Burleigh County.									
John Yegen	7635		Sept. 29	10.9	10.4	70.3	7.8	1.39	453
Cass County.									
J. R. Fuller	7647		Oct. 1	13.7	13.0	72.9	4.5	1.62	550
Do	7648	Klein Wanzlebener	Oct. 1	13.2	12.5	74.2	10.2	1.29	575
M. Woodhull	7721		Oct. 6	8.3	7.9	59.2	4.6	1.80	1,102
G. N. Smith	8425	Klein Wanzlebener	Nov. 15	16.2	15.4	79.0	11.7	1.39	760
Do	8426	Dippe's Vilmorin	Nov. 15	17.1	16.3	86.8	14.1	1.21	695
Average				13.7	13.0	75.5	9.0	1.56	736
Dickey County.									
Charles Stekl	7991	Florimond Desprez	Oct. 25	10.5	10.0	67.3	6.3	1.66	1,050
Do	7992	Klein Wanzlebener	Oct. 25	12.7	12.1	73.4	8.8	1.44	1,070
Average				11.6	11.0	70.4	7.6	15.5	1,060
Morton County.									
Joseph Miller	7764	Brabant	Oct 10	14.5	13.8	73.9	8.1	1.79	508

NORTH DAKOTA—Continued.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Nelson County.				P. ct.	P. ct.			P. ct.	Gr'ms.
James Lawer	7683		Oct. 4	14.3	13.6	74.1	9.9	1.45	675
Ransom County.									
I. J. Oliver	7612	Klein Wanzlebener	Sept. 27	10.9	10.4	70.8	8.1	1.35	805
Do	7613	do	Sept. 27	12.6	12.0	73.7	9.9	1.35	825
Do	7614	Florimond Desprez	Sept. 27	9.4	8.9	67.6	7.5	1.26	820
Do	7615	do	Sept. 27	10.6	10.1	73.1	8.8	1.21	725
Average				10.9	10.3	71.3	8.6	1.29	794
Sargent County.									
Henry Straub	8198	Vilmorin	Nov. 11	22.1	21.0	......	18.3	1.21	220
Do	8199	do	Nov. 11	21.6	20.5	......	18.4	1.17	215
Average				21.9	20.8	......	18.4	1.19	218
Stutsman County.									
J. J. Nierling	7792	Klein Wanzlebener	Oct. 11	13.2	12.5	77.6	10.5	1.26	570
Traill County.									
G. von Steinwehr	7600		Sept. 24	10.5	10.0	69.1	8.1	1.30	1,022
Do	7601		Sept. 24	10.3	9.9	70.1	8.1	1.39	796
P. Herbrandson	7926	Klein Wanzlebener	Oct. 20	13.8	13.1	78.4	12.3	1.12	1,263
Bure Bureson	7953	do	Oct. 23	20.6	19.6	84.1	17.0	1.21	397
Wm. Carson	7957	do	Oct. 23	16.7	15.9	73.6	8.8	1.81	288
N. F. Griswold	7958	do	Oct. 23	18.6	17.7	79.1	12.2	1.51	490
C. Cranston	8210		Nov. 14	17.8	16.9	82.4	12.5	1.43	650
Average				15.5	14.7	76.7	11.3	1.91	701

OHIO.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Butler County.									
Jno. W. McClellan	7645		Oct. 1	9.7	9.2	76.4	9.8	0.99	1,017
Erie County.									
B. J. Messig	7797		Oct. 11	9.3	8.8	71.5	8.1	1.15	305
Hamilton County.									
Henry L. Law	8461		Dec. 9	13.1	12.4	80.9	9.4	1.39	458
Sandusky County.									
C. W. Storer	8075	Klein Wanzlebener	Oct. 30	12.2	11.6	82.4	10.9	1.12	570
B. B. Overmyer	8408	Simon Legrand	Nov. 24	14.2	13.5	77.2	11.3	1.26	1,210
Do	8409	Klein Wanzlebener	Nov. 24	12.3	11.7	71.1	8.9	1.39	1,025
Average				12.9	12.3	76.9	10.3	1.26	935
Trumbull County.									
D. H. Wilder	7894	Vilmorin	Oct. 16	10,1	9.6	69.6	10.1	.99	801
Do	7895	Lane's Improved	Oct. 16	8.0	7.6	77.6	8.9	.90	1,113
Do	7896	do	Oct. 16	11.1	10.6	88.8	13.7	.81	485
Do	7897	Vilmorin	Oct. 16	9.0	8.6	76.9	8.3	1.08	1,273
Do	8280		Nov. 19	9.1	8.7	70.0	7.2	1.26	507
Do	8281		Nov. 19	11.9	11.3	81.0	12.0	.99	1,010
Do	8282		Nov. 19	11.6	11.0	81.1	14.3	.81	371
Average				10.1	9.6	77.9	10.6	9.8	808
Van Wert County.									
Marion Davidson	7889	Silesian	Oct. 16	5.7	5.4	......	3.4	1.66	320
Do	7890	do	Oct. 16	7.4	7.0	67.3	5.1	1.44	420
Average				6.6	6.2	67.3	4.2	1.55	370

OREGON.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Jackson County.				P. ct.	P. ct.			P. ct.	Gr'ms.
F. X. Musty	8428		Nov. 28	15.3	14.5	72.2	9.1	.68	610
Do	8129		Nov. 28	16.4	15.6	74.5	17.3	.95	510
Average				15.9	15.1	73.4	14.2	.82	560

PENNSYLVANIA.

Dauphin County.									
E. H. Leib	8285	Green Top	Nov. 19	8.8	8.4	74.6	7.0	1.26	1,014
Do	8286	Red Top	Nov. 19	8.9	8.4	78.8	9.0	.99	1,404
Average				8.9	8.4	76.7	8.0	1.13	1,209
Lancaster County.									
F. M. Weaver	7363	Klein Wanzlebener	Sept. 18	6.8	6.5	63.5	6.6	1.03	1,067
Do	7364	Lemaire	Sept. 18	6.3	6.0	82.2	5.6	1.12	362
Do	7365	Florimond Desprez	Sept. 18	10.3	9.8	78.0	12.0	.86	380
L. Wingenrath	7636	Klein Wanzlebener	Sept. 29	8.6	8.2	74.1	8.7	.99	537
Do	7637	Florimond Desprez	Sept. 29	9.8	9.3	73.7	9.5	1.03	560
Frank Stauffer	7749	Dippe's Vilmorin	Oct. 9	6.9	6.6	65.1	8.4	.82	445
Do	7750		Oct. 9	6.6	6.3		7.0	.94	610
Average				9.3	7.5	72.8	8.3	.97	566
Philadelphia County.									
N. Bait	8411	White Sugar	Nov. 24	10.9	10.4	75.2	9.0	1.21	1,225

SOUTH DAKOTA.

Brookings County.									
South Dakota Agricultural Experiment Station.	8116	Bulteau Desprez Richest.	Nov. 3	15.7	14.9	84.0	14.5	1.08	570
Do	8117	Dippe's Vilmorin	Nov. 3	15.9	15.1	84.1	18.5	.87	390
Do	8118	Oxnard Factory	Nov. 3	17.8	16.9	91.3	20.7	.86	328
Do	8119	Pajarro Valley, Cal	Nov. 3	14.4	13.8	76.6	13.3	1.00	418
Do	8120	Florimond Desprez	Nov. 3	13.0	12.4	85.0	7.8	1.67	585
Do	8121	Klein Wanzlebener	Nov. 3	15.2	14.4	86.4		Lost.	556
Do	8122	Simon Legrand White Improved.	Nov. 3	14.2	13.5	87.1		Lost.	454
Average				15.2	14.4	84.9	14.9	1.10	472
Brown County.									
Andrew Ballweg	8435	Klein Wanzlebener	Dec. 1	17.2	16.3	80.4	14.7	1.17	295
Davidson County.									
Salem Bruner	7870		Oct. 15	10.7	10.2	66.0	5.9	1.80	821
H. C. Preston	8082		Oct. 31	15.8	15.0	78.6	13.1	1.21	790
Average				13.3	12.6	72.3	9.5	1.51	806
Grant County.									
D. W. Diggs	8043		Oct. 28	11.6	11.0	73.0	7.4	1.57	856
Hyde County.									
Jno. C. Stoner	7661	Simon Legrand	Oct. 3	13.2	12.5	79.5	13.1	1.01	725
Do	7662	do	Oct. 3	13.7	13.0	78.7	11.1	1.23	795
Do	7961		Oct. 23	14.6	13.9	76.0	14.8	99	445
Do	7962		Oct. 23	13.3	12.6	81.1	11.0	1.21	510
Average				13.7	13.0	78.8	12.5	1.11	619

SOUTH DAKOTA—Continued.

Name of grower.	Serial No.	Variety.	When received	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Kingsbury County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
W. A. Palmer	7603	Florimond-Desprez	Sept. 25	9.0	8.6	68.2	6.9	1.30	655
Do	7604	Simon Legrand	Sept. 25	13.0	12.4	73.4	9.0	1.44	450
Average				11.0	10.5	71.1	8.0	1.37	553
McCook County.									
Asael Larson	8049	White Improved	Oct. 29	11.0	10.5	76.4	10.9	1.03	385
Do	8050	do	Oct. 29	11.4	10.8	......	9.7	1.17	345
Average				11.2	10.6	76.4	10.3	1.10	365
Mead County.									
W. P. Flowers	8412		Nov. 24	14.7	14.0	72.1	8.6	1.71	780
Do	8413		Nov. 24	14.8	14.1	76.3	11.4	1.30	750
Average				14.8	14.1	74.2	10.0	1.51	765

TEXAS.

Name of grower.	Serial No.	Variety.	When received	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Scurry County.									
W. M. Sawyer	8024		Oct. 27	9.9	9.4	67.3	6.9	1.44	1,150
Do	8025		Oct. 27	11.0	10.5	71.4	8.2	1.35	995
Average				10.5	10.0	69.3	7.6	1.39	1,072

VIRGINIA.

Name of grower.	Serial No.	Variety.	When received	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Augusta County.									
O. K. Lapham	7756	Florimond Desprez Richest.	Oct. 9	10.0	9.5	78.7	13.9	.72	470
Do	7757	Klein Wanzlebener	Oct. 9	9.8	9.3	74.2	10.5	.93	576
Do	7758	Lane's Imperial	Oct. 9	8.6	8.2	75.4	9.9	.85	590
Do	7759	Lemaire	Oct. 9	8.9	8.5	71.8	9.9	.90	665
Do	7760	Vilmorin	Oct. 9	8.7	8.3	67.4	9.0	.97	465
Do	7761	do	Oct. 9	6.1	5.8	......	6.1	1.00	835
Wm. Goodwin	8154	Florimond-Desprez	Nov. 7	12.8	12.2	78.0	14.9	.86	228
Do	8155	Klein Wanzlebener	Nov. 7	11.1	10.6	69.1	14.4	.77	245
Do	8156	Lane's Improved Imperial.	Nov. 7	13.3	12.6	84.7	19.6	.68	260
Do	8157	Lemaire Richest	Nov. 7	15.3	14.5	83.2	17.8	.86	170
Do	8158	Vilmorin	Nov. 7	12.1	11.5	80.7	10.8	1.12	255
Do	8159	Vilmorin Improved Imperial.	Nov. 7	16.1	15.3	83.8	20.9	.77	265
J. J. Pennybacker	8402	Florimond Desprez	Nov. 22	12.6	12.0	......	7.6	.81	650
Do	8403	Klein Wanzlebener	Nov. 22	14.9	14.2	......	15.2	.63	350
Do	8404	Lane's Improved Imperial.	Nov. 22	13.3	12.6	.....	16.4	.72	305
Do	8405	Lemaire Richest	Nov. 22	13.6	12.9	73.9	13.3	1.48	228
Do	8406	Dippe's Vilmorin	Nov. 22	14.3	13.6	74.9	10.9	1.48	378
Do	8407	Vilmorin Improved	Nov. 22	13.9	13.2	72.9	11.8	1.75	525
Average				12.0	11.4	76.3	12.9	.96	415
Loudoun County.									
J. B. McLaughlin	7995		Oct. 25	6.6	6.3	53.7	4.6	1.44	430
Do	7996		Oct. 25	4.8	4.6	.....	3.3	1.44	530
Average				5.7	5.4	53.7	4.0	1.44	480

WASHINGTON.

Name of grower.	Serial No.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beet.
Lewis County.									
				P. ct.	*P. ct.*			*P. ct.*	*Gr'ms.*
W. J. Hoyne	8436		Dec. 2	16.0	15.2	84.2	14.2	1.12	450

WISCONSIN.

Calumet County.									
Gotfried Abitz	7808	Klein Wanzlebener	Oct. 13	9.9	9.4	78.0	8.3	1.20	1,300
Do	7809	Vilmorin Dippe's	Oct. 13	13.9	13.2	86.9	18.3	.76	315
Do	7869	Simon Legrand imported.	Oct. 14	13.9	13.2	90.2	17.0	.82	500
Average				12.6	11.9	81.9	14.5	.93	705
Kewaunee County.									
W. Seyk	7701	Dippe's Richest	Oct. 6	15.7	14.9	81.3	14.3	1.10	813
Do	7861	Imported from Bohemia.	Oct. 13	12.6	12.0	77.8	11.5	1.10	450
Average				14.2	13.5	79.6	12.9	1.10	632
Ozaukee County.									
Ernest Barkhausen	7943	Lemaire Richest	Oct. 22	11.5	10.9	......	13.4	.86	420
Do	7944	do	Oct. 22	13.2	12.5	81.5	14.7	.90	590
Average				12.4	11.7	81.5	14.1	.88	505
Vernon County.									
A. J. Rusk	8166		Nov. 7	12.5	11.9	82.3	12.1	1.03	800
Do	8167		Nov. 7	14.8	14.1	80.9	14.4	1.03	420
Do	8168		Nov. 7	16.2	15.4	......	18.0	.90	260
Average				14.5	13.8	81.6	14.9	.99	493

WYOMING.

Carbon County.									
E. E. Bernard	7390	Vilmorin	Sept. 24	13.3	12.6	73.4	11.9	1.12	1,005
Do	7391	Pink Top	Sept. 24	12.5	11.9	72.2	11.6	1.08	1,420
Average				12.9	12.3	72.8	11.8	1.10	1,213
Crook County.									
H. C. Hensel	7784		Oct. 10	17.1	16.3	......	12.2	1.40	210
Laramie County.									
Henry S. Parker	8053		Oct. 29	16.7	15.8	84.8	12.4	1.35	690
Do	8054		Oct. 29	19.8	18.8	......	16.9	1.17	325
Average				18.3	17.3	84.8	14.7	1.26	508

Table showing beets having from 15 to 18 per cent. sucrose.

Name of grower.	Serial No.	State.	County.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
						Per ct.	*Per ct.*			*Per ct.*	*Gr.*
University of California	7619	California	Los Angeles	Vilmorin	Sept. 27	16.8	16.0	87.0	17.9	.94	352
Do	7616	do	do	Excelsior	Sept. 27	16.3	15.5	84.5	18.1	.90	407
C. S. Crandall	8035	Colorado	Larimer	Bulteau Desprez	Oct. 27	16.0	15.2	86.0	16.9	.95	395
Do	8036	do	do	do	Oct. 27	15.5	14.7	84.7	16.3	.95	460
Do	8038	do	do	Klein Wanzlebener	Oct. 27	15.9	15.1	86.0	16.7	.95	805
Do	8039	do	do	Florimond Desprez	Oct. 27	16.2	15.4	84.4	18.0	.90	475
H. R. Rhone	8073	do	Mesa	Not given	Oct. 30	15.2	14.4	86.4	13.0	1.17	453
Pueblo Board of Trade	8178	do	Pueblo	do	Nov. 8	15.5	14.7	82.9	13.3	1.17	650
Do	8179	do	do	do	Nov. 8	15.9	15.1	84.1	14.0	1.12	580
Do	8180	do	do	do	Nov. 8	15.4	14.6	83.7	14.3	1.08	485
C. W. Zepp	8055	do	Yuma	Simon Legrand	Oct. 29	15.7	14.9	79.7	12.1	1.30	333
E. McAllister	8266	Illinois	Will	French Richest	Nov. 17	15.9	15.1	85.0	16.1	.99	600
F. H. Crumb	8216	do	Warren	Florimond Desprez	Nov. 14	15.3	14.5	87.0	17.0	.90	610
J. A. Fellers	7775	Iowa	Black Hawk	Klein Wanzlebener	Oct. 10	15.9	15.1	81.5	18.1	.88	625
R. Hoff	7892	do	Webster	Vilmorin	Oct. 16	15.9	15.1	95.2	18.3	.81	320
Do	8173	do	do	do	Nov. 8	17.6	16.7	91.1	25.9	.68	520
August Bohme	8021	do	Carroll	do	Oct. 27	15.5	14.7	85.2	14.4	1.08	213
G. B. Lord	7811	Kansas	Johnson	Vilmorin	Oct. 13	16.8	16.0	....	12.2	1.38	180
A. L. Bandy	8041	do	Hamilton	Klein Wanzlebener	Oct. 28	15.7	14.9	82.2	13.8	1.12	720
O. Coyle	8433	do	Barber	Not given	Dec. 1	17.8	16.9	84.8	17.3	1.03	140
Maryland Agricultural Experiment Station.	8057	Maryland	Prince George	Dippe's Vilmorin	Oct. 29	15.9	15.1	90.4	19.6	.81	383
Do	8200	do	do	do	Nov. 12	15.4	14.6	....	26.1	.59	170
Do	8229	do	do	do	Nov. 15	15.1	14.4	83.9	15.9	.95	385
Do	8249	do	do	do	Nov. 15	15.4	14.6	82.8	24.4	.63	555
Do	8254	do	do	do	Nov. 15	15.1	14.4	86.3	19.6	.77	245
Do	8443	do	do	Simon Legrand	Dec. 4	17.6	16.7	91.2	19.6	.90	213
Do	8444	do	do	Bulteau Desprez Richest	Dec. 4	17.8	16.9	84.8	19.8	.90	163
Do	8446	do	do	Klein Wanzlebener	Dec. 4	17.4	16.5	....	17.6	.99	125
W. H. Tenney & Co.	8139	Massachusetts	Suffolk	Not given	Nov. 5	16.8	16.0	82.8	17.0	.99	350
J. R. Devenport	8284	Michigan	Muskegon	Russian	Nov. 19	16.4	15.6	89.1	17.2	.95	355
Dr. E. J. Howe	7696	do	Ionia	Lemaire	Oct. 6	17.7	16.8	84.7	21.6	.82	387
J. S. Lawson	8047	do	Macomb	Klein Wanzlebener	Oct. 29	16.8	16.0	89.8	28.5	.59	680
Do	8048	do	do	Simon Legrand	Oct. 29	15.5	14.7	85.2	18.0	.86	705
Robert Glover	7606	Minnesota	Wilkin	Dutch	Sept. 24	15.4	14.6	80.6	15.6	.99	447
John Hunter	7659	do	Anoka	Not given	Oct. 2	15.9	15.1	84.1	17.2	.93	680
Do	7707	do	do	do	Oct. 6	16.3	15.5	82.3	18.3	.89	387
Leonhard Ziermann	7753	do	Carver	Klein Wanzlebener	Oct. 9	15.8	15.0	81.0	15.2	1.04	503
E. A. Donnell	7788	do	Goodhue	do	Oct. 11	16.9	16.1	86.7	18.2	.93	447
W. H. Budd	7877	do	Martin	do	Oct. 15	15.0	14.3	85.2	13.9	1.08	730
Peter Weinand	8151	do	Hennepin	Not given	Nov. 6	16.5	15.7	79.3	15.3	1.08	847
W. H. Loverin	8171	do	do	Klein Wanzlebener	Nov. 8	15.6	14.8	87.2	15.8	.99	600
Simon Huntington	8007	do	Cottonwood	Florimond Desprez	Oct. 27	15.6	14.8	72.9	10.8	1.44	675

Table showing beets having from 15 *to* 18 *per cent. surcrose*—Continued.

Name of grower.	Serial. No.	State.	County.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
						Per ct.	*Per ct.*			*Per ct.*	*Gr.*
James Taylor	8218	Minnesota	Murray	Not given	Nov. 14	17.1	16.3	84.7	17.3	.99	475
H. C. Bartlett	8103	do	Travers	Simon Legrand	Nov. 3	17.5	16.6	73.3	14.6	1.21	575
H. W. Koch	8110	do	Dakota	German sugar	Nov. 3	16.7	15.9	84.4	14.3	1.17	400
A. De Sutter	8127	do	Lyon	Not given	Nov. 4	17.6	16.7	83.8	11.5	1.53	480
Hans Jagers	8062	do	Becker	do	Oct. 30	15.0	14.3	77.3	11.8	1.26	1,060
E. Jonason	7632	do	Chisago	Florimond Desprez	Sept. 29	15.1	14.4	79.5	14.0	1.08	495
Gus. Olson	7982	Nebraska	Kearney	Klein Wanzlebener	Oct. 24	15.6	14.8	76.1	13.3	1.17	214
J. D. Evans	7656	do	Hamilton	Not given	Oct. 2	15.1	14.4	....	13.1	1.15	210
A. H. Gale	8211	do	Rock	Klein Wanzlebener	Nov. 14	15.2	14.4	83.1	12.1	1.26	400
J. B. Olson	8219	do	Phelps		Nov. 14	16.0	15.2	75.8	10.5	1.53	290
M. O'Connor	7738	do	Garfield	Vilmorin	Oct. 8	17.6	16.7	83.4	13.7	1.28	860
J. Gabriel	8128	do	Saunders	Not given	Nov. 4	17.7	16.8	....	17.2	1.03	305
Do	8129	do	do	do	Nov. 4	15.3	14.5	83.2	14.9	1.03	370
C. H. Purinton	7915	do	Perkins	Klein Wanzlebener	Oct. 18	16.5	15.7	79.3	12.7	1.30	955
H. S. Morton	7640	do	Knox	Not given	Sept. 29	15.3	14.5	81.4	13.1	1.17	595
Henry Smith	8417	do	York	do	Nov. 24	16.4	15.6	78.5	11.1	1.48	445
Do	8418	do	do	do	Nov. 24	15.4	14.6	....	9.5	1.62	210
J. B. Martin	8010	do	Colfax	Vilmorin	Oct. 27	15.4	14.6	81.9	14.3	1.08	523
Hans Stodt	7891	do	Hall	Not given	Oct. 16	16.4	15.6	90.6	13.5	1.21	448
Fred. Suehlsen	7893	do	do	German white	Oct. 16	17.5	16.6	87.1	17.7	.99	398
H. H. Taylor	8045	do	Hitchcock	Lemaire	Oct. 28	17.7	16.8	76.3	11.3	1.57	413
Do	8046	do	do	Desprez	Oct. 28	17.5	16.6	76.1	11.4	1.53	350
H. H. Saunders	7865	do	Holt	Not given	Oct. 14	16.1	15.3	79.9	11.3	1.43	1,300
W. B. Lower	8002	do	do	Imported white	Oct. 25	15.1	14.4	81.6	14.7	1.03	670
C. C. Ward	8453	do	Thayer	Klein Wanzlebeuer	Dec. 6	16.9	16.1	77.9	12.2	1.39	335
Do	8455	do	do	Desprez	Dec. 6	17.1	16.2	83.2	13.6	1.26	292
Do	8458	do	do	Klein Wanzlebener	Dec. 6	15.9	15.1	76.4	9.5	1.62	500
T. E. Tackley	7938	do	Pawnee	Florimond Desprez	Oct. 21	15.6	14.8	83.4	14.5	1.08	432
C. A. Ready	7817	do	Hayes	Not given	Oct. 13	17.3	16.4	79.7	12.5	1.39	590
G. L. Sherman	7860	do	Frontier	Desprez	Oct. 25	17.1	16.3	85.9	16.4	1.04	490
W. F. Sherman	7993	do	do	Vilmorin improved	Oct. 25	15.7	14.9	81.3	12.1	1.30	350
A. Richardson	8085	do	Sheridan	Not given	Oct. 31	15.8	15.0	....	10.6	1.53	340
C. Osterman	8124	do	Dodge		Nov. 4	16.3	15.5	83.2	15.8	1.03	450
R. P. Gregg	7975	do	Dawes	Klein Wanzlebener	Oct. 24	16.2	15.4	72.7	8.4	1.93	290
P. W. Tracy	7801	do	Box Butte	do	Oct. 11	15.0	14.3	68.5	10.0	1.50	407
F. H. Trowbridge	7366	do	Antelope	Not given	Sept. 22	16.1	15.3	82.1	16.9	.95	241
Do	7367	do	do	do	Sept. 22	15.9	15.0	81.5	16.7	.95	226
Do	7368	do	do	do	Sept. 22	16.6	15.8	88.8	16.1	1.03	176
C. A. Hathaway	7675	do	do	Klein Wanzlebener	Oct. 4	16.0	15.3	....	13.6	1.18	265
W. H. Corneny	7998	do	do	Florimond Desprez	Oct. 25	16.5	15.7	86.4	16.7	.99	380
E. Adams	8109	do	do	Vilmorin	Nov. 3	16.7	15.9	80.7	10.0	1.67	400
J. Whiter	8000	do	Lincoln	do	Oct. 25	15.8	15.0	86.8	16.4	.90	930
A. D. Lemly	8262	New York	Genesee	Lane's or French	Nov. 17	15.0	14.3	83.3	18.5	.81	1,210

Wm. Carson	7957	North Dakota	Traill	Klein Wanzlebener	Oct. 23	16.7	15.9	73.6	8.8	1.81	288
C. Cranston	8210	...do	...do	Not given	Nov. 14	17.8	16.9	82.4	12.5	1.43	650
G. N. Smith	8425	...do	Cass	Klein Wanzlebener	Nov. 15	16.2	15.4	79.0	11.7	1.39	760
Do	8426	...do	...do	Dippe's Vilmorin	Nov. 15	17.1	16.3	86.8	14.1	1.21	690
F. X. Musty	8428	Oregon	Jackson	Not given	Nov. 28	15.3	14.5	72.2	9.1	.68	610
Do	8429	...do	...do	...do	Nov. 28	16.4	15.6	74.5	17.3	.95	510
H. C. Preston	8082	South Dakota	Davidson	...do	Oct. 31	15.8	15.0	78.6	13.1	1.21	790
South Dakota Agricultural Experimental Station.	8116	...do	Brooking	Bulteau Desprez Richest	Nov. 3	15.7	14.9	84.0	14.5	1.08	570
Do	8117	...do	...do	Dippe's Vilmorin	Nov. 3	15.9	15.1	84.1	18.5	.87	390
Do	8118	...do	...do	Oxnard Factory	Nov. 3	17.8	16.9	91.3	20.7	.86	328
Do	8121	...do	...do	Klein Wanzlebener	Nov. 3	15.2	14.4	86.4	......	......	556
A. Ballweg	8435	...do	Brown	...do	Dec. 1	17.2	16.3	80.4	14.7	1.17	295
Wm. Goodwin	8157	Virginia	Augusta	Lemaire Richest	Nov. 7	15.3	14.5	83.2	17.8	.86	170
Do	8159	...do	...do	Vilmorin Improved	Nov. 7	16.1	15.3	83.8	20.9	.77	265
W. J. Hoyne	8436	Washington	Louise	Not given	Dec. 2	16.0	15.2	84.2	14.2	1.12	450
W. Seyk	7701	Wisconsin	Kewaunee	Dippe's Richest	Oct. 6	15.7	14.9	81.3	14.3	1.10	813
A. J. Rusk	8168	...do	Vernon	Not given	Nov. 7	16.2	15.4	......	18.0	.90	260
H. C. Hensel	7784	Wyoming	Crook	...do	Oct. 10	17.1	16.3	......	12.2	1.40	210
Henry S. Parker	8053	...do	Laramie	...do	Oct. 29	16.7	15.8	84.8	12.4	1.35	690

Table showing beets having 18 per cent. sucrose and over.

C. W. Zepp	8113	Colorado	Yuma	Klein Wanzlebener	Nov. 3	19.2	18.2	......	13.3	1.44	93
John Betts	8273	Indiana	Clinton	Not given	Nov. 17	19.1	18.2	78.9	14.7	1.30	410
R. Hoff	8172	Iowa	Webster	Vilmorin	Nov. 8	18.1	17.2	87.5	23.5	.77	220
Maryland Agricultural Experimental Station.	8438	Maryland	Prince Georges	...do	Dec. 4	22.0	21.0	......	34.9	.63	90
Do	8439	...do	...do	Bulteau Desprez	Dec. 4	18.4	17.5	......	23.9	.77	40
Do	8440	...do	...do	Florimond Desprez	Dec. 4	20.0	19.0	......	27.8	.72	58
Do	8441	...do	...do	Klein Wanzlebener	Dec. 4	19.8	18.8	......	22.0	.90	63
Do	8442	...do	...do	Vilmorin	Dec. 4	19.9	18.9	94.8	20.9	.95	375
W. H. Maxwell	8208	Minnesota	Murray	Klein Wanzlebener	Nov. 14	18.6	17.7	84.3	19.6	.95	279
James Taylor	8209	...do	...do	...do	Nov. 14	18.7	17.8	82.4	18.2	1.03	280
H. C. Bartlet	8102	...do	Travers	German Legrand	Nov. 3	18.3	17.4	79.2	14.1	1.30	840
J. H. Knowles	8268	Nebraska	Lincoln	Klein Wanzlebener	Nov. 17	19.8	18.8	82.8	14.7	1.35	515
F. H. Trowbridge	7369	...do	Antelope	Not given	Sept. 22	18.8	17.9	81.8	18.3	1.03	119
T. A. Fleming	8084	...do	Sheridan	...do	Oct. 31	19.6	18.6	78.7	12.5	1.57	500
E. H. Benedict	7710	...do	Holt	Klein Wanzlebener	Oct. 6	19.8	18.8	......	12.7	1.56	205
Do	7711	...do	...do	...do	Oct. 6	18.1	17.2	......	10.7	1.69	187
Edgar Bruner	8197	...do	...do	Not given	Nov. 11	20.4	19.4	73.9	10.8	1.89	220
C. E. Ward	8454	...do	Thayer	Lemaire	Dec. 6	18.3	17.4	82.1	13.6	1.35	385
Do	8456	...do	...do	Klein Wanzlebener	Dec. 6	18.2	17.3	84.7	16.9	1.08	323
William Gauser	8138	...do	Scott Bluff	Not given	Nov. 5	23.9	22.7	83.3	15.6	1.50	333
C. D. Emerson	8447	...do	Kearney	Lemaire Richest	Dec. 4	22.8	21.7	......	13.7	1.66	155
Do	8448	...do	...do	Klein Wanzlebener	Dec. 4	25.5	24.2	......	14.6	1.75	303
G. W. Hultz	8028	...do	Deuel	...do	Oct. 27	19.8	18.8	......	12.2	1.62	248
Dan Neff	7973	...do	Perkins	...do	Oct. 24	18.0	17.1	90.5	15.4	1.17	630

Table showing beets having 18 per cent. sucrose and over—Continued.

Name of grower.	Serial No.	State.	County.	Variety.	When received.	Sucrose in juice.	Sucrose in beet.	Purity.	Saline coefficient.	Ash.	Average weight of beets.
						Per ct.	*Per ct.*			*Per ct.*	*Gr.*
Bure Bureson	7953	North Dakota	Traill	Klein Wanzlebener	Oct. 23	20.6	19.6	84.1	17.0	1.21	397
N. V Griswold	7958	....do	....do	....do	Oct. 23	18.6	17.7	79.1	12.2	1.51	490
Henry Straub	8198	... do	Sargent	Vilmorin	Nov. 11	22.1	21.0	....	18.3	1.21	220
Do	8199	....do	....do	....do	Nov. 11	21.6	20.5	....	18.4	1.17	215
Henry S. Parker	8054	Wyoming	Laramie	Not given	Oct. 29	19.8	18.8	....	16.9	1.17	325

Table showing yield of beets of different weights per acre, etc.

Weight of beet.	Weight of beet.	Yield per acre.	Available sugar per acre in pounds.														
			8 per cent.	9 per cent.	10 per cent.	11 per cent.	12 per cent.	13 per cent.	14 per cent.	15 per cent.	16 per cent.	17 per cent.	18 per cent.	19 per cent.	20 per cent.	21 per cent.	22 per cent.
Grammes.	*Ounces.*	*Tons.*															
100	3.53	4.40	563	634	704	774	845	915	986	1,056	1,126	1,197	1,267	1,338	1,408	1,478	1,549
200	7.06	8.80	1,126	1,267	1,408	1,549	1,690	1,830	1,971	2,112	2,253	2,394	2,534	2,675	2,816	2,957	3,098
300	10.59	13.20	1,680	1,901	2,112	2,323	2,534	2,746	2,957	3,168	3,379	3,590	3,802	4,013	4,224	4,435	4,646
400	14.12	17.60	2,253	2,534	2,816	3,098	3,379	3,661	3,942	4,224	4,506	4,787	5,069	5,350	5,632	5,914	
500	17.65	22.00	2,816	3,168	3,520	3,872	4,224	4,576	4,928	5,280	5,632	5,984	6,336	5,688	7,040		
600	21.18	26.40	3,379	3,802	4,224	4,646	5,069	5,491	5,914	6,336	6,758	7,181	7,603	8.026			
700	24.71	30.80	3,942	4,435	4,928	5,421	5,914	6,406	6,899	7,392	7,885	8,378	8,870				
800	28.24	35.20	4,506	5,069	5,632	6,195	6,758	7,322	7,885	8,448	9,011	9,574					
900	31.77	39.60	5,069	5,702	6,336	6,970	7,603	8.237	8,870	9,504	10,138						
1,000	35.30	44.00	5,632	6,336	7,040	7,744	8,448	9,152	9,856	10,560							
1,100	38.83	48.40	6,195	6,970	7,744	8,518	9,293	10,067	10,842								
1,200	42.36	52.80	6,758	7,603	8,448	9,193	10,138	10,982									
1,300	45.89	57.20	7,322	8,237	9,152	10,067	10,982										
1,400	49.42	61.60	7,885	8,870	9,856	10,842											
1,500	52.95	66.00	8,448	9,504	10,560												

EXPLANATORY NOTE.—To get the yield of beets per acre of any given weight, follow the line of the given weight to the right to column of yield in tons. The columns of figures under the several per cents of sugar in the beets give roughly the quantity of sugar which would be obtained per acre, with the yield and richness indicated. To get the total sugar per acre, multiply the per cent in each case by 2,000, and by the yield per acre in tons. Thus the total sugar produced per acre for a beet having 14 per cent of sugar and having a weight of 600 grammes would be 14 × 2,000 × 26.4=7,392 pounds.

The yield in tons is based on the supposition that 40,000 plants grow upon each acre. This rule could be applied to beets up to 700 grammes in weight, but above that the number of beets per acre would not reach so high a figure. The yields, therefore, for beets over 100 grammes are exaggerated. It was thought best, however, to complete the table on the one plan.

The available sugar is given approximately at 80 per cent of the total sugar. The actual amount of sugar obtained in any instance might vary largely from the number, but 80 per cent may be taken as a fair average yield.

In the preceding summary of the beets sent from Nebraska are not included those which were examined at the Grand Island Sugar Factory under the direction of the Chemical Division, but only those which were sent directly to the Department at Washington for examination. In addition to these two sets of analyses large numbers of samples were examined in the laboratory of the Agricultural Experiment Station at Lincoln.

The following table contains the results of the analyses made by Mr. H. E. L. Horton at Grand Island, Nebr., on samples of beets delivered for manufacture:

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Allen, E. M	Schuyler, Colfax Co	2	285	20.0	16.8	84.0
Anderson, E. C	Dannebrog, Howard Co	1	204	20.3	17.1	84.2
Anton, Conrad	Palmer, Merrick Co	3	130	18.6	16.0	86.7
Appel, Christ	Dannebrog, Howard Co	1	189	20.1	17.9	89.1
Asterbold, W	Grand Island	9	251	20.2	16.5	83.2
Aye, Peter	do	4	204	19.7	16.4	82.8
Do	do	2	273	20.6	17.5	84.9
Barnard, Alfred	Alda, Hall Co	1	419	20.5	16.5	80.5
Barick, William	do	3	131	20.0	16.6	83.0
Barth, Fritz	Grand Island	12	173	19.3	16.3	84.0
Baumann, Eno	do	3	221	20.2	16.9	83.8
Baumann, Remmet	do	2	209	19.5	16.5	82.5
Backkova, Fr	St Michael, Buffalo Co	1	....	19.1	16.3	85.3
Bame, E	Schuyler, Colfax Co	1	242	19.6	16.7	85.2
Beekmann, A	Grand Island	1	351	19.0	15.2	80.0
Becker, Fritz	do	1	232	23.5	20.1	85.5
Do	do	1	124	19.9	16.7	83.9
Berry, George	Seward, Seward Co	2	280	19.7	16.7	84.8
Bern, Friedrich	Grand Island	9	255	19.5	16.3	83.0
Bemis, A. H	Seward, Seward Co	3	334	18.1	14.9	82.4
Beberniss, John	Grand Island	12	294	19.3	16.0	82.6
Bell, D. E	Chapman, Merrick Co	3	231	20.0	16.7	83.4
Beberniss, Fritz	Grand Island	15	212	20.5	17.3	84.4
Belville, Joseph	Chapman, Merrick Co	7	203	18.6	15.8	85.0
Beyer, Karl	Grand Island	10	273	18.7	15.9	84.2
Blaine, H. M	do	1	209	19.8	17.1	86.9
Blunk, Ad		15	218	20.1	17.4	86.9
Bowman, S. S	Wood River, Hall Co	1	188	21.0	16.4	78.1
Boose, Johann	Grand Island	12	188	18.5	15.6	82.7
Boekholm, Carl	Cairo, Hall Co	7	182	19.6	16.3	81.4
Boersen, Henry	Grand Island	12	....	....	....	....
Bruckner, R. J	Nantasket, Buffalo Co	1	267	20.5	17.7	86.3
Brannan, F	Central City, Merrick Co	1	217	22.1	17.9	81.6
Brachmann, D	St. Libory, Howard Co	1	275	18.2	14.4	79.8
Brandt, David	Abbott, Hall Co	4	245	20.4	17.4	87.0
Braasch, Adolph	Grand Island	8	213	19.2	15.6	81.2
Bruckmann, E	do	5	302	18.9	15.5	82.8
Buckow, Fritz	do	1	542	19.5	16.5	84.6
Bullock, J. A	Alda, Hall Co	1	178	18.4	16.1	87.4
Burman, Oscar	Boelus, Howard Co	1	215	21.2	17.9	84.4
Buhmann, Hury	St. Libory, Howard Co	1	....	19.3	16.7	....
Buell, H. G	Chapman, Merrick Co	5	199	18.8	15.5	82.4
Buchholz, Fr	Grand Island	9	178	18.2	15.3	81.6
Buhlke, John	do	5	287	19.1	16.0	83.8
Busing, Ernst	do	2	229	18.9	15.8	85.6
Case, C	Clarks, Merrick Co	1	334	20.0	15.5	77.5
Carr, Geo. W	St. Michael, Buffalo Co	1	160	18.2	15.1	82.9
Carter, Fr. M	St. Paul, Howard Co	1	....	22.7	18.2	....
Carlsen, N. T	Dannebrog, Howard Co	1	....	....	16.6	....
Campbell, J. M	Cairo, Hall Co	2	240	20.0	15.9	79.2
Clad, Jno. E. R	Chapman, Merrick Co	1	322	22.8	18.8	82.5
Class, Frank	Ravenna, Buffalo Co	1	160	20.5	16.4	80.0
Clarks Sugar and Beet Co	Clarks, Merrick Co	1	187	23.2	19.1	82.3
Claussen, Turgen	Grand Island	7	282	20.6	17.3	84.0
Cranlviseur, John	Columbus, Platte Co	1	270	21.5	18.4	85.6
Craig, C., E. and A. R		8	279	18.8	15.5	82.4
Cushman, I. B	Chapman, Merrick Co	13	269	18.8	15.6	83.0
Cunningham, M. J	Wood River, Hall Co	6	230	19.3	16.4	84.8
Daniels, A. P	Clarks, Merrick Co	1	207	19.8	16.6	78.2

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Dankert, Hans	Grand Island	1	335	18.4	15.4	83.7
Damman, Claus	do	1	217	19.7	17.3	87.8
David, M. F	Broken Bow, Custer Co	1	339	22.1	17.6	79.6
Daberkon, Karl	Grand Island	4	173	18.8	15.9	86.0
De Moss, W. T	Shelton, Hall Co	1	164	23.4	21.0	89.3
Detlef, S	Grand Island	8	138	20.2	16.7	81.9
Detlef, Cristen	do	4	265	18.9	15.5	81.9
Deichmann, Carl	do	22	306	19.4	16.4	84.5
Diehl, E	Cairo, Hall Co	1	146	20.5	16.8	81.9
Diekmann, Peter	St. Libory, Howard Co	4	277	19.4	16.6	86.7
Dorgensen, Saren	Dannebrog, Howard Co	1	228	19.5	16.2	83.1
Dohms, Carl	Grand Island	9	178	18.7	15.4	82.4
Dobrinske, Aug	do	3	332	20.6	17.5	84.6
Drake, Leroy	Shelton, Buffalo Co	1	....	19.3	17.0	88.1
Dutton, Jas. H	Chapman, Merrick Co	2	198	20.9	17.6	83.8
Dünermann, C. H	Grand Island	18	251	20.4	17.3	85.1
Dunermann, G	do	12	197	19.3	15.8	84.0
Eickhoff, H	do	4	219	19.7	16.1	82.7
Elstermeur, Carl	do	1	173	22.3	18.2	81.7
Ennis, Martin	do	1	271	17.7	15.0	84.7
Enders, Casper	St. Libory, Howard Co	2	....	20.3	16.6	81.6
Erozim, Chas	Ravenna, Buffalo Co	1	....	23.0	18.5	80.5
Erickson, Jacob	Nysted, Howard Co	1	....	18.2	14.6	80.2
Erickson, Nels	do	1	390	20.7	17.4	84.1
Ernstmeyer, F	Grand Island	5	224	19.6	15.6	80.1
Erozim, Anton	Ravenna, Buffalo Co	2	....	19.6	15.9	85.4
Ewoldt, Cay	Grand Island	1	409	15.3	11.9	77.7
Ewold, B	do	11	259	17.3	14.1	81.5
Ewold, Claus	do	2	443	18.2	14.5	80.0
Ewing, John	Wood River, Hall Co	4	180	19.0	16.5	83.4
Falldorf, Fred	Grand Island	11	206	18.6	15.5	82.1
Falles, W. H	do	2	125	20.7	17.8	85.3
Fay, Peter	St. Libory, Howard Co	1	212	18.3	15.4	84.1
Farnham, D. W	Central City, Merrick Co	1	98	19.9	16.7	83.9
Fisher, John	Ravenna, Buffalo Co	1	232	19.8	16.1	81.3
Fishburn, W. H	Grand Island	8	....	19.8	15.8	79.3
Fischer, Jul	do	6	234	20.1	17.7	89.9
Flörke, Heinz	do	7	275	19.7	16.4	83.5
Folson, James	do	5	211	19.4	16.1	83.0
Foulk, Geo	St. Paul, Howard Co	....	....	....	....	....
Frauen, Jos	St. Libory, Howard Co	1	234	20.0	17.1	85.5
Frey, J. S	Boelus, Howard Co	1	193	20.0	16.7	83.5
Frauen, Paul	Lockwood, Merrick Co	10	331	19.1	16.1	83.7
Franz, Fred	Alda, Hall Co	3	....	20.0	17.0	87.6
Friend, John	Grand Island	4	191	19.9	16.8	84.5
Frank, Jacob	do	11	271	20.0	16.6	84.0
Gallup, Henry A	Alda, Hall Co	5	131	19.0	15.7	82.6
Gatwerth, Erbs	Duncan, Platte Co	1	212	18.7	15.9	84.4
Gallup, Henry A	Alda, Hall Co	1	163	19.5	16.1	82.5
Gehrt, Peter	Nantasket, Buffalo Co	1	210	18.3	15.5	84.7
Gerard, A	Bellwood, Butler Co	1	270	21.5	18.4	85.6
Geisinger, Felix	Grand Island	10	263	19.6	15.3	81.6
Giese, Henry	do	6	....	17.8	18.0	82.0
Glaggner, Paul	do	4	240	20.9	17.8	85.2
Gottschalk, Fritz	Fremont, Dodge Co	1	414	17.5	13.4	76.4
Goehring, Rich	Grand Island	14	218	19.5	16.9	85.1
Goehring, Richard	do	3	151	19.6	16.2	87.3
Goetsche, Christ	do	4	119	21.5	18.2	83.9
Gosda, Herman	do	2	204	18.4	15.6	84.7
Grant, Jas	St. Libory, Howard Co	1	303	18.2	14.6	80.2
Grotzky, Claus	Merrick Co	5	179	18.5	15.3	82.1
Grozch, Julius	Grand Island, Hall Co	6	180	19.3	16.0	83.2
Grembe, Jacob	do	4	....	17.2	15.1	87.2
Grotzky, Claus	....	2	144	20.3	17.6	86.8
Grumpecht, Carl	Shelton, Buffalo Co	1	142	18.5	14.1	76.2
Gutzow, Henry	Grand Island	1	....	21.0	19.9	....
Grünther Bros	Ravenna, Buffalo Co	1	255	18.7	15.2	81.2
Haldemann, J. T	Alda, Hall Co	1	78	19.8	16.6	83.9
Hannibal, P. M	Dannebrog, Howard Co	1	211	19.2	16.3	84.9
Ham, Henry	Grand Island	1	236	16.8	12.6	75.0
Hansen, Peter	Dannebrog, Howard Co	1	221	17.1	11.8	69.0
Hamilton, T. M	Warner's Addition	5	194	17.9	14.5	81.0
Hand, John	Seward, Seward Co	2	294	18.9	15.5	81.6
Harris, T. R	Marquette, Hamilton Co	1	138	20.3	16.7	83.1
Ham, Moses	St. Michael, Buffalo Co	1	215	18.3	14.2	72.1
Hamilton, T. M	Grand Island	24	410	18.9	15.9	84.1
Hanssen, Gils	do	11	257	19.9	16.7	84.1
Halling, Wm	Merrick Co	16	239	19.2	16.0	82.7
Hansen, Jens	Dannebrog, Howard Co	2	254	18.7	15.8	84.7

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Haun, Y. C	Grand Island	10	....	21.5	18.4	87.6
Hamlin, J. J	Seward, Seward Co	2	151	19.2	15.7	81.7
Hansjosten, Peter	Chapman, Merrick Co	6	278	19.4	16.2	83.5
Hansen, Jens	Boelus, Howard Co	5	285	20.3	16.9	83.2
Hansjosten, Jahn	Grand Island	21	245	19.4	15.6	81.9
Hasman, Ernst and Fritz	do	25	241	19.2	16.4	84.6
Henrikson, M	Dannebrog, Howard Co	1	246	20.0	16.2	....
Henrikson, L. H	Boelus, Howard Co	1	343	18.8	15.5	82.4
Hermansen, Martin	Dannebrog, Howard Co	1	236	20.6	17.5	81.9
Hegeman, O. R	Buckley, Jefferson Co	1	135	20.9	18.1	86.6
Hensel, Wm	Shelton, Buffalo Co	1	232	21.0	17.7	84.3
Hume, Heim	Grand Island	8	178	18.7	11.7	78.6
Hessel, Joseph	do	8	227	20.0	15.9	82.0
Hein, Claus	Fremont, Dodge Co	2	227	20.5	17.5	85.4
Hein, Mathias	Chapman, Merrick Co	2	192	22.4	18.9	84.3
Heinz, Nich	Pleasant Add., Hall Co	8	266	19.1	16.4	85.9
Helkrey, Jay	Norfolk, Madison Co	3	488	19.0	15.8	83.2
Hillis, Jno. & W	Doniphan, Hall Co	3	317	19.5	15.8	82.8
Horak, John	Sherman Co	1	292	20.0	16.3	81.5
Houseworth, More	Fremont, Dodge Co	1	324	20.1	17.2	85.6
Houten, J.D. van	Norman, Kearney Co	1	204	21.5	19.4	90.2
Hohman, Caspar	Grand Island	9	134	19.6	16.0	81.6
Honeywell, G. W	St. Paul, Howard Co	2	310	21.0	18.5	88.3
Hunter, C. H	Seward, Seward Co	1	130	20.6	17.4	84.5
Hund, G. & B	Cairo, Hall Co	3	260	19.5	15.6	82.1
Husch, Peter	Grand Island	9	212	19.7	16.8	85.3
Janssen, Peter	Rockville, Sherman Co	1	101	19.6	16.9	86.2
Jacob, Georg	St. Paul, Howard Co	2	396	19.2	15.5	80.0
Jensen, Christ	Dannebrog, Howard Co	1	324	16.8	14.2	84.5
Karp, Chas	St. Michael, Buffalo Co	1	143	20.6	17.3	83.9
Karstel, George	St. Libory, Howard Co	1	286	21.2	18.3	86.3
Kettler, A. B	do	2	321	18.9	16.3	86.4
Kent, M	Grand Island	1	219	20.6	18.1	87.8
Keühn, H. F. W	Dannebrog, Howard Co	1	277	20.2	16.0	79.2
Ketteler, A. H	St. Libory, Howard Co	2	289	19.8	16.3	82.5
Kunyon, Ch	Boelus, Howard Co	1	270	20.8	17.2	82.7
Keinch, M. E	Cairo, Hall Co	1	211	20.0	17.1	80.5
Kingsley, O. H	Clarks, Merrick Co	3	164	20.7	16.3	83.2
Klase, Rob	Doniphan, Hall Co	1	354	16.1	14.1	....
Kleine, E	Grand Island	1	206	19.0	14.8	77.8
Klein, Ernst	do	1	....	21.8	16.7	80.7
Klingenberg, Hans	Chapman, Merrick Co	2	339	18.5	15.5	83.7
Klunker, Fred	Shelton, Buffalo Co	2	360	19.7	15.9	79.6
Knipphals, Chr	Grand Island	8	221	19.7	15.8	82.3
Kosch, Vincent	Boelus, Howard Co	1	215	21.2	17.9	84.4
Kolar, Joseph	Ravenna, Buffalo Co	1	181	20.0	16.8	84.0
Kozel, Anton	Ravenna, Buffalo Co	2	373	21.2	17.5	82.5
Köhler, Oscar	Grand Island	11	240	20.2	17.6	87.1
Kroeger, Hans	do	1	169	20.8	17.3	83.2
Kroeger, Rud	do	4	219	20.4	17.2	82.7
Kruse, Henry		15	252	19.1	16.0	83.4
Kraemer, Peter	Merrick Co	25	276	18.4	15.0	81.4
Krekuke, Jul	Alda, Hall Co	4	277	19.9	16.6	85.8
Kroeger, Fred	Grand Island	9	286	19.2	15.7	81.8
Kroeger, Michael	do	21	283	20.6	18.8	85.4
Kuhlman, W. M	do	1	186	19.7	15.6	79.1
Kuhner, Karl	Philips, Hamilton Co	5	204	18.0	15.0	83.3
Kundsen, B	St. Libory, Howard Co	1	180	17.7	14.6	82.4
Kutschkan, Gus	Grand Island	3	151	21.0	17.5	83.4
Lamsen, John	Dannebrog, Howard Co	1	110	19.2	15.6	81.3
Lange, Henry		12	351	18.5	15.6	84.5
Lange, H	Grand Island	11	170	20.4	17.8	86.8
Lassen, Conrad	do	5	290	17.5	14.3	83.9
Leppin, Wm	do	12	168	19.5	16.2	83.6
Leppin, Christ	do	11	161	22.8	18.6	82.9
Linden, John P	do	5	277	17.2	14.0	81.1
Lilienthal, H	do	17	247	19.2	16.1	83.4
Linelstrom, M. J	Boelus, Howard Co	1	187	21.0	17.8	84.8
Lopmann, Wilhelm	Grand Island	11	175	20.3	16.5	81.2
Long, T. M	St. Michael, Buffalo Co	1	101	19.9	17.7	88.9
Lübs, Henry	Alda, Hall Co	2	261	21.5	18.3	84.9
Luth, Fred	Grand Island	5	....	20.1	16.1	83.4
Lübbe, Claus	do	19	234	19.5	16.5	85.4
Lyons, Miles	Wood River, Hall Co	1	261	21.0	16.9	156.7
Marshall, John	Columbus, Platt Co	1	237	18.7	15.6	83.4
Martin, David	Central City, Merrick Co	1	274	20.1	16.7	83.1
Marshal, Thos. F	Columbus, Platt Co	1	207	18.2	14.8	81.3
Madson, P. Ch	Dannebrog, Howard Co	1	388	19.7	16.4	83.2
Marshal, Jas	Columbus, Platt Co	1	269	19.5	16.1	82.6

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Martin, J. B	Schuyler, Colfax Co	2	374	20.7	16.7	80.5
Martin, J. L	Chapman, Merrick Co	3	360	18.8	15.7	83.3
McKee and H. B. Wray	Alda, Hall Co	5	200	19.8	16.6	82.5
McDaniel, W. R	Cairo, Hall Co	1	151	20.5	18.5	90.2
McLoin, R	Fremont, Dodge Co	1	271	18.8	15.7	83.4
McIntosh, W. G	Rockville, Sherman Co	1	117	20.2	16.8	83.1
Mettembrick, C	Grand Island	13	211	19.0	15.9	83.3
Melson, L	Dannebrog, Howard Co	1	138	20.2	16.7	82.7
Mildenskein, N	Grand Island	6	195	18.8	15.5	82.2
Millard, C. E	O'Neill, Holt Co	2	278	20.3	16.3	81.6
Mitchell, Robert	Grand Island	13	238	18.4	15.0	82.1
Mohr, John	do	4	313	19.8	16.9	84.4
Morse, Marenas	Clarks, Merrick Co	4	270	20.4	16.7	82.3
Moody, J. L	Scotia, Greeley Co	2	274	18.8	15.6	82.7
Mohr, Peter	Grand Island	11	285	19.1	16.2	84.5
Moore, P. C	Central City, Merrick Co	1	407	20.0	16.0	80.0
Morris, C. H	Chapman, Merrick Co	1	160	23.5	18.2	....
Morey, Gorden	Cairo, Hall Co	....	231	20.5	17.5	85.4
Müeller, Ludwig	Chapman, Merrick Co	4	193	17.9	14.8	82.5
Muhl, Peter	do	2	209	22.1	18.5	83.9
McMullen, R	Grand Island	11	265	18.6	15.4	83.2
Myers, John	Shelton, Hall Co	1	272	23.7	20.2	85.2
Naffke, Carl	Grand Island	15	321	18.6	15.6	83.3
Navy, Wenzel	Ravenna, Buffalo Co	2	249	21.7	17.8	82.3
Neubert, Johann	Grand Island	13	254	18.8	15.3	81.5
Neubert, John	do	3	164	20.4	17.1	85.3
Nerills, M. T	Wood River, Hall Co	1	273	21.4	17.9	83.6
Nelson, N	Dannebrog, Howard Co	1	264	19.8	17.0	85.8
Nieturger, Christian	Grand Island	4	246	21.6	18.7	86.4
Nietfeld, Wm	do	7	307	19.2	16.1	82.9
Nissen, Chr	do	4	192	20.0	17.0	81.2
Nietfeld, Henry	do	2	203	21.0	17.4	82.8
Nichols, H. W	St. Paul, Howard Co	1	....	21.8	18.7	85.8
Nietfeld, Fritz	Grand Island	1	161	19.7	16.6	84.3
Noack, Ernst	Shelton, Buffalo Co	2	111	21.2	17.6	83.0
Norris, C. E	Ravenna, Buffalo Co	1	283	20.1	16.7	83.0
Obermeyer, Henry	Grand Island	11	196	18.8	15.4	82.2
Ohlmann, Fred	Shelton, Buffalo Co	1	282	23.4	21.3	82.0
Oltmann, John	Grand Island	9	257	20.9	17.3	82.9
Olsen, Fred	Nysted, Howard Co.	6	247	19.9	16.3	82.6
Onist, J. D	Shelton, Buffalo Co	1	327	23.2	19.2	82.7
Orndorff, Peter	Alda, Hall Co	1	189	20.2	16.2	....
Pahl, Hans	Grand Island, Hall Co	3	208	20.2	17.4	85.8
Paustian, G	do	12	284	20.1	16.5	82.0
Peters, C. T	St. Libory, Howard Co	2	211	19.8	16.9	85.2
Petzald, Louis	Grand Island, Hall Co	4	343	20.4	17.1	83.6
Peters, C. T	St. Libory, Howard Co	3	290	20.3	16.8	82.6
Peterson, W. C	Fremont, Dodge Co	1	412	17.7	14.7	79.6
Peterson, H. P	Dannebrog, Howard Co	1	189	19.2	15.5	....
Pitrek, Chas	Ravenna, Buffalo Co	2	173	21.2	17.4	83.1
Piefer, Henry	Grand Island, Hall Co	6	174	20.2	16.9	83.6
Pickett, James	Ravenna, Buffalo Co	1	145	18.4	14.4	78.8
Pitrick, John	Ravenna, Buffalo Co	1	170	20.1	15.7	....
Pohl, Jacob	Grand Island, Hall Co	4	333	20.5	17.3	84.0
Polenz, Julius	Ravenna, Buffalo Co	1	367	18.6	15.7	....
Prudy, H. G., and Launborn.	Lawrence, Nuckolls Co	6	265	20.8	17.6	84.6
Puchert, Chas	Ravenna, Buffalo Co	1	....	20.5	15.5	75.6
Roehler, H	Grand Island, Hall Co	5	115	22.3	18.3	82.5
Rapp, L. F	Broken Bow, Custer Co	1	403	19.4	15.1	77.8
Rasmussen, Jens	Dannebrog, Howard Co,	1	140	19.5	16.5	....
Raunert, Mathias	Grand Island, Hall Co	6	253	18.5	15.3	82.7
Rasmussen, H. C	Chapman, Merrick Co	5	234	17.7	14.4	81.3
Rein, Olsen	St. Libory, Howard Co	2	191	17.1	14.5	84.9
Reher, Chr	Grand Island, Hall Co	17	310	18.6	15.5	83.1
Remlo, Fred	do	4	139	18.6	15.4	82.1
Reher, John Fred	do	13	194	20.1	17.5	87.0
Reid, J. H., and Son	Columbus, Platte Co	1	243	20.2	17.4	86.1
Reyner, H	Broken Bow, Custer Co	1	236	23.5	19.2	81.7
Richardson, D	Alda, Hall Co	3	217	19.5	16.1	84.4
Ritterbush, H	Grand Island, Hall Co	2	262	19.9	16.5	83.1
Rizoe, A. J	do	3	114	20.4	17.5	85.7
Richter, Aug	Doniphan, Hall Co	1	402	18.8	15.9	84.6
Rieff Henry	Grand Island, Hall Co	1	337	21.3	18.9	88.7
Rowe, D	Fremont, Dodge Co	2	419	18.4	14.6	79.2
Rosk, Frank	St. Libory, Howard Co	2	290	18.6	16.1	87.2
Rosenkalter, Carl	Grand Island, Hall Co	13	171	19.8	16.5	83.4
Rosswick, Henry	Cairo, Hall Co	2	205	18.7	14.9	80.0
Roby, Gustav	Grand Island, Hall Co	8	297	19.5	16.4	82.9

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Roby, Fred	Grand Island, Hall Co	17	220	19.4	16.2	88.2
Rohweder, Henry	do	1	183	18.8	14.6	....
Rohling, Fr.	Kelsa, Howard Co	1	222	17.4	13.0	74.1
Ropke, Heirick	St. Libory, Howard Co.	1	375	20.3	15.9	73.4
Russell, J. B.	Grand Island, Hall Co.	4	218	19.8	16.7	84.6
Ruge, Hans	do	5	173	20.2	17.2	86.2
Ruttstson, Ch. J	Boelus, Howard Co	1	215	21.2	17.9	84.4
Russell, G. W	St. Paul, Howard Co	1	....	21.0	18.2	85.7
Salyards, David	Richland, Colfax Co	1	200	19.4	17.0	87.6
Schmidt, Ernst	Fremont, Dodge Co	1	402	17.4	15.0	84.3
Schroeder, Wm	Columbus, Platte Co	1	204	19.4	16.2	83.4
Schlund, Nat	St. Michael, Buffalo Co	1	126	18.1	15.1	83.4
Schaubdach, Chi	Alda, Hall Co	9	336	20.2	16.7	82.8
Schruale, Carl	Grand Island, Hall Co	7	192	19.7	16.1	81.6
Schultz, John	do	12	208	17.9	14.8	83.3
Schleichardt, Fr	do	14	247	19.7	16.1	81.7
Schultz, Ludwig	do	13	286	21.1	18.2	85.9
Schroeder, Fritz	Alda, Hall Co	8	237	18.3	15.4	84.1
Schuldt, John	Schuyler, Colfax Co	2	317	18.9	14.9	78.6
Schuster, Heinrich	Phillips, Hamilton Co	3	242	18.9	15.7	83.0
Schinkel, John	Grand Island, Hall Co	4	225	18.3	14.1	77.4
Schmale, H	do	7	200	19.6	16.4	83.2
Schultz, Peter	Cairo, Hall Co	7	215	20.2	17.3	85.2
Schoenstein, Alb	Grand Island, Hall Co	2	166	18.5	15.3	82.6
Schimmer, Henry	do	14	255	18.8	15.7	83.1
Schipmann, H	do	4	196	20.9	18.2	88.0
Schultz, Ernst	do	5	358	19.7	17.1	86.5
Scherzbeig, C	....	7	336	20.1	16.4	81.5
Serei, John	Grand Island, Hall Co	9	197	20.7	15.9	77.5
Seehusen, John	Dannebrog, Howard Co	2	227	19.0	14.8	....
Senkbeil, Rud	Grand Island, Hall Co	8	246	18.4	15.2	63.0
Sears, C. H.	Clarks, Merrick Co	2	158	21.3	18.3	85.8
Seibert, Reed	Grand Island, Hall Co	4	222	19.4	15.8	82.3
Seifert, David	Boelus, Howard Co	1	289	16.8	13.0	77.2
Shipman, H	Grand Island, Hall Co	2	270	17.4	13.2	75.6
Shoof, Henry	Oconel, Platte Co	2	197	19.8	16.5	82.9
Shoman, Wm	Clarks, Merrick Co	1	135	19.3	16.2	83.9
Silvers, Theo	Grand Island, Hall Co	4	....	19.1	15.4	....
Sigman, Walter	Cairo, Hall Co	1	192	18.3	15.4	....
Skoogard, C. T	Nysted, Howard Co	3	280	20.3	17.2	85.8
Smithwick, M	Grand Island, Hall Co	17	198	20.1	17.3	86.6
Smith, Alex	Seward, Seward Co	2	245	17.9	14.0	78.1
Smith, A. O	Central City, Merrick Co	2	312	20.4	16.9	83.0
Sondermeyer, Caspar	Grand Island, Hall Co	11	223	19.5	15.7	80.8
Sothman, Gus	Shelton, Buffalo Co	2	305	20.3	17.6	86.8
Sorensen, E. H	Dannebrog, Howard Co	1	232	20.5	16.3	79.5
Sothman, Claus	St. Michael, Buffalo Co	1	117	21.4	19.0	88.7
Spethman, Leopold	Grand Island, Hall Co	7	184	18.8	16.1	83.6
Spech, N. and McElhenny, D.	Cairo, Hall Co	1	354	20.4	16.5	....
Specht, Nat	St. Michael, Buffalo Co	1	....	15.8	13.1	82.9
Stuhr, Hans	Grand Island, Hall Co	16	250	18.9	15.8	83.3
Steinbeck, Diedt	do	3	202	19.4	16.0	82.3
Steinbeig, H	do	2	184	19.0	15.4	81.9
Stuhr, Gebs	do	6	384	17.8	14.4	80.7
Stalt, Hans	do	3	288	20.5	17.7	82.9
Stegemann, Ernst	Marquette, Hamilton Co	3	275	17.3	13.9	80.1
Stiller, Wilhelm	Grand Island, Hall Co	9	210	18.8	15.2	82.0
Stoltenberg, Claus	do	15	246	20.3	17.3	84.4
Steinmeyer, H	do	5	....	16.6	13.5	85.0
Stepe, Henry	do	1	136	19.9	16.2	81.9
Sundbeig, E. N	Dannebrog, Howard Co	2	130	18.9	15.1	83.6
Sueplsen, Fritz	Grand Island, Hall Co	1	....	18.6	15.9	....
Taylor, T. W	Columbus, Platte Co	1	113	20.4	18.3	89.7
Taylor, F. N	Wood River, Hall Co	1	187	21.2	17.4	82.0
Taylor, John R	Seward, Seward Co	1	165	18.8	15.3	81.3
Thavernet, G	Grand Island, Hall Co	2	....	15.5	14.0	89.6
Thompsen, John	do	14	218	19.5	16.5	84.7
Thomas, C. N	Chapman, Merrick Co	1	171	17.8	13.7	71.3
Thacker, W. R.	Ravenna, Buffalo Co	1	....	16.1	13.1	81.4
Tinge, C	St. Libory, Howard Co	1	343	15.2	12.2	80.2
Tomanch, Fr.	Nimberg, Butler Co	1	335	21.4	18.8	87.8
Tolkey, John	Rockville, Sherman Co	1	191	17.9	15.2	84.9
Trummer, Hermann	Grand Island, Hall Co	8	250	20.5	17.3	86.5
Turner, N. H	Columbus, Platte Co	1	161	21.8	19.6	89.9
Underhill, I. C	Cairo, Hall Co	1	343	18.8	15.5	82.5
Unger, August	St. Michael, Buffalo Co	1	....	17.8	14.2	79.8
Veudt, Chas	Clarks, Merrick Co	1	125	18.9	15.9	85.9
Veeder, W. H	Grand Island, Hall Co	1	180	20.2	17.0	84.1

Name.	Post-office address.	No. of samples.	Average weight of beet.	Total solids indicated by Brix spindle.	Sucrose in juice.	Purity coefficient.
			Grams.	*Pr. ct.*	*Pr. ct.*	
Vocke, Herman H	Grand Island, Hall Co	1	229	21.2	17.8	83.9
Voss, Hans	....do	18	261	19.1	15.7	82.6
Vose, Heinrich	....do	3	149	18.6	15.3	82.0
Wallter, Aug	Palmer, Merrick Co	1	230	20.6	18.4	89.3
Wagner, Bernhard	St. Libory, Howard Co	1	147	20.8	17.1	82.2
Waters, George	Clarks, Merrick Co	1	121	18.8	15.7	88.9
Wagner, Traugott	Grand Island, Hall Co	5	354	18.1	14.5	80.1
Wagner, Christ	St. Libory, Howard Co	11	323	18.9	15.7	83.4
Ward, C. E. & Co	Belvidere, Thayer Co	2	279	19.9	16.3	79.8
West, W. H	Cairo, Hall Co	1	....	17.2	13.9	....
Wells & Wieman	Schuyler, Colfax Co	11	478	20.2	15.7	77.6
Wegner, Herman	Grand Island, Hall Co	13	253	19.7	16.2	81.5
Werner, Franz B	....do	11	268	19.8	17.0	86.2
Weiss, Fred	....do	9	235	18.9	15.1	79.9
Weinhold, Paul and Weyer H.	....do	6	190	20.3	17.6	86.5
Weller, Conrad	....do	12	234	20.9	18.3	83.5
Wheeler, Jasel	Bromfield, Hamilton Co	2	213	20.2	17.4	85.9
Witt, C. F	Grand Island, Hall Co	1	416	20.6	17.3	83.9
Wilt, Heinrich G	Rockville, Sherman Co	1	101	19.6	16.9	86.2
Wiene, Bernt	Bromfield, Hamilton Co	1	....	....	....	....
Wissink, Jan	St. Libory, Howard Co	1	....	17.7	15.4	87.0
Wienhake, Heinrich	Grand Island, Hall Co	3	205	19.6	15.8	80.4
Windolph, Adam	....do	9	332	20.0	16.6	83.6
Williams, W. T. and W. G.	Alda, Hall Co	3	278	19.7	16.1	61.6
Wines, E. J	Grand Island, Hall Co	17	260	19.6	16.6	84.2
Wilkelmie, Wilh	Chapman, Merrick Co	8	195	18.3	14.9	81.0
Windolph, C	Grand Island, Hall Co	19	193	19.3	16.2	83.1
Wiese, Wm	....do	3	280	18.3	15.2	82.6
Will, Wm	Columbus, Platte Co	3	250	20.7	17.2	82.8
Witt, Wilhelm	Alda, Hall Co	3	161	19.2	15.5	82.8
Woodworth, T. L	Chapman, Merrick Co	2	141	19.5	15.9	81.3
Wulf, Wilhelm	Grand Island, Hall Co	8	208	18.7	14.8	79.5
Yessen, Peter	Chapman, Merrick Co	4	271	19.2	16.4	85.6
Do	....do	1	200	18.5	14.7	74.0
Yohnik, Henry	....	23	333	20.0	16.5	83.9
Zehrke, Julius	Ravenna, Buffalo Co	1	148	19.5	16.0	82.0
Zeleny, Jos	Nimberg, Butler Co	1	335	21.4	18.8	78.8
Zlanke, E	Grand Island, Hall Co	6	243	19.4	16.1	84.2
Tamsen, Fritz	Alda, Hall Co	6	197	19.9	15.7	78.5
Means	....	......	238.9	19.6	16.3	83.2

Total number of samples, 1,866.

CHARACTER OF BEETS DELIVERED TO THE GRAND ISLAND FACTORY.

Through the courtesy of Mr. H. T. Oxnard the Department was allowed to establish a laboratory in the sugar factory at Grand Island for the purpose of obtaining information in regard to the character of the beets entering into manufacture. In all about three thousand samples of beets were examined, a sample having been taken from every wagonload and every carload of beets delivered to the factory. These samples were taken in such a way as to give as nearly as possible the average character of all the beets worked. A large number of beets was taken from each sample, and after they had been properly cleaned and dried their average weight was taken. The beets were then rasped, the juice expressed, and an analysis made on the expressed juice. The total solid matter was determined by a specific-gravity spindle, and the percentage of sucrose in the juice was estimated by the polariscope. The purity efficient was determined by dividing the percentage of sucrose in the juice as indicated by the polariscope by the percentage of total solids as indicated by the spindle.

AVERAGE WEIGHT OF BEETS.

The average weight of all the beets examined was 238.9 grammes. This small size of the beet was doubtless due to the extremely dry season. The drought throughout the region covered by the sugar-beet fields was the most severe perhaps that has ever been known in the State of Nebraska. Ordinary crops such as corn were almost total failures, and it is a matter of encouragement to note that in such a season the beets, although not making an average yield, yet did fairly well. On the whole, however, it must be confessed that the results from an agricultural point of view were disappointing; but this disappointment must be chiefly attributed to the exceptionally severe drought already mentioned.

It is also doubtless true that in the practice of the new system of agriculture which is required for the proper production of sugar beets many failures were made, and perhaps very few of the farmers practiced that form of agriculture which was best suited to the soil and the season. In a soil which is apt to be dry, as in Nebraska, too much attention can not be paid to the importance of loosening the ground to a good depth. Deep plowing, followed by deep subsoiling, together with such harrowing and other treatment of the surface as will produce a perfect tilth, are absolutely essential to the production of a profitable crop.

The remarkably high percentage of sucrose shown in the juice is an evidence of the fact that the soil and climate of Nebraska are favorable to the production of a beet rich in crystallizable sugar. It must, however, not be forgotten that the extremely high percentage of sucrose in the juice is probably a reciprocal of the small size of the beet due to the dry season. Had the season been favorable to the production of a beet of average size, with a tonnage of from 15 to 20 per acre, the percentage of sucrose in the beets would doubtless have been less. This is well illustrated in the data obtained in the Department from the analysis of sugar beets sent from Nebraska. It is evident from the character of the samples which were received by the Department that the farmers have selected the larger beets to be sent on for analysis. It is seen by comparison of the respective sizes of the beets received for analysis by the Department with those received for manufacture at Grand Island that the beets sent on for analysis were about three times the size of those manufactured into sugar. It will also be noticed that in the beets received for analysis by the Department the percentage of sucrose is low as compared with those which entered into manufacture at Grand Island. It would therefore hardly be just to claim that beets as rich as those manufactured at Grand Island during the past season can be grown in quantities of from 15 to 20 tons per acre. It is not a matter of surprise that many of the farmers who grew beets are discouraged at the results of the first year's work. The planting and cultivation of the sugar beet, as is well known, are matters which require great labor and expense, and when, therefore, an unfavorable season cuts the crop very short, it is but natural that the farmer should be discontented. It is, however, difficult to see how he could have done better with any other crop, and the fact that in many instances even with the present dry season the farmers of Nebraska were able to grow 10 or even 15 tons per acre, shows that with proper cultivation and proper attention in other ways to the growing crop the evils which attend a severe drought can be greatly mitigated if not altogether avoided. It is not the purpose of the Department to encourage farmers to engage in an industry which does not give promise of success; but it will be a matter of regret to every one who desires to see the success of the sugar industry if the discontent which naturally attends a very unfavorable season should be sufficient to deter farmers from continuing the cultivation of a crop which under ordinary conditions promises so fair a yield as sugar beets. It would be wiser on the part of the farmers to continue the cultivation of the sugar-beet until it has been demonstrated at least that even with favorable years it is not profitable. In that case it would be necessary to cease the cultivation of a crop which afforded no prospect of financial success.

EXPERIMENTS WITH SUGAR BEETS IN WISCONSIN.

Extensive experiments were carried on in Wisconsin during the season of 1891 by the Department in coöperation with the agricultural experiment station under direction of Prof. W. A. Henry.

The general directions for the work were given by the Department, but all the details thereof were left to the supervision of Professor Henry.

The results of the work were encouraging, and its data, arranged by F. W. Woll, chemist of the station, will be found following:

Seeds of the following six varieties of sugar beets were received from the U. S. Department of Agriculture in the beginning of May: Dippe's Vilmorin, Dippe's Klein Wanzlebener, Simon Legrand's White Improved, Bulteau Desprez Richest, and Lemaire's Richest. About 3 acres of land were prepared at the experiment farm for beet culture, and divided up between the varieties in proportion to the quantity of seed on hand. Arrangements were further made with five farmers living in different parts of the State to grow three of the varieties, viz: Simon Legrand's White Improved, Bulteau Desprez Richest, and Dippe's Klein Wanzlebener, on a piece of land, 3 square rods for each variety; to send samples of the beets grown at different times for examination of sugar content, and to report the results as regards culture and yield. Notice was given in the newspapers that a supply of sugar-beet seed was on hand for distribution among farmers who would investigate the adaptability of their soils for sugar-beet culture, with the obligation to send samples of the beets grown for analysis. In this way, samples of beets from seventy farmers were received and analyzed;

about half of these received their seed from the station, and the majority of the rest received seed directly from the U. S. Department of Agriculture.

First are given the results of the beet culture at the station, then those of the culture at substations, and finally the results of examinations of beets grown by farmers in different parts of this State.

SUGAR-BEET CULTURE AT WISCONSIN AGRICULTURAL EXPERIMENT STATION, SEASON 1890.

Two plats, 1⅓ and 1½ acres, were set apart for sugar beets during the spring of 1890. Potatoes had been grown on Plat A the preceding year; on Plat B clover was grown the preceding year, and the land plowed that fall; the soil was a light clay, a portion of Plat B being a sandy loam. The beets were planted in rows 20 inches apart on Plat A, with beets every 8 inches in the row, the following varieties were planted on May 27 on this plat: Dippe's Klein Wanzlebener, Simon Legrand's White Improved, Bulteau Desprez Richest, and Dippe's Vilmorin. On the other plat (Plat B) the beets were planted in rows 30 inches, with beets every 10 inches in the row; the following varieties were planted in this way on May 28: Florimond Desprez Richest, Lemaire's Richest, and Dippe's Vilmorin. The seed of the last variety was divided between the plats, so as to determine the influence of different thickness of planting on the yield of beets.

The beets received the very best treatment during their period of growth that the circumstances would allow. The heavy rains in the beginning and middle of June made cultivation impossible for a time, and gave the weeds more of a start than they would otherwise have had. The cultivation was done partly by a harrow tooth cultivator, or by a wheel hoe and shovel attachment with shields, or by hand. The weeds in the rows between the beets could not be reached in any other than by a hand hoe. The features of the growing season were plenty of rain in May, June, August, and October, with a temperature somewhat below normal during May, August, and September, and higher than normal in June. The main meteorological data for the season are given in the following table:

Meteorological data for summer, 1890, *for Madison, Wis.*

[From observations made at Washburn Observatory.]

Month.	Temperature.				Rainfall.	
	Max.	Min.	Mean.	Mean normal.	1890.	Normal.
	°F.	°F.	°F.	°F.	*Inches.*	*Inches.*
May	84	33	53.0	57.8	5.03	3.64
June	93	50	70.6	67.2	7.72	4.42
July	91	54	71.7	72.7	1.81	4.19
August	93	46	66.1	69.4	4.23	3.28
September	83	36	57.4	61.0	2.62	3.35
October	69	25	48.2	48.5	4.59	2.87
Total	......	......	......	....	25.00	21.75

Samples of the beets grown were taken every week from September 5 on. Three to four beets of every variety of what seemed average size were pulled and the average sugar content in the same ascertained by the polariscope. While it is not believed that the beets sampled in every case represented exactly the stage of growth of each variety at the time, the analysis may indicate in a general way the increase in sugar content and in the purity of the juice of the beets. The following table gives the results of the weekly examinations of each plat. The average weight of the beets sampled is also given:

PLAT A.

[Distance between rows, 20 inches; between beets in the row, 8 inches.]

Date.	Dippe's Vilmorin.			Bulteau Desprez.			Klein Wanzlebener.			Simon Legrand.			Average sucrose in juice.	Purity coefficient.
	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.		
	Grms.	*P. ct.*		*Grms.*	*P. ct.*		*Grms.*	*P. ct.*		*Grms.*	*P. ct.*		*P. ct.*	
Sept. 5	452	11.87	78.2	239	10.79	73.4	355	11.77	77.5	476	11.81	82.9	11.56	78.0
15	551	12.91	86.6	578	12.72	80.2	482	13.02	83.4	591	12.51	77.7	12.79	82.0
22	453	15.29	85.3	631	13.87	83.1	472	14.74	83.3	640	13.38	82.6	14.27	83.6
30	401	15.78	86.9	604	15.27	84.1	409	14.06	82.7	495	15.38	84.7	15.12	84.6
Oct. 7	535	17.64	85.6	574	14.85	83.9	588	16.14	83.7	388	16.68	87 1	16.33	85 1
16	670	*15.43	84.5	561	15.52	86.1	486	14.33	84.8	900	14.60	84.2	14.97	84.9
23	419	16.01	85.0	324	16.03	87.2	547	15.92	87.7	506	16.15	83.8	16.03	85.9
30	566	16.76	86.3	567	14.81	83.9	407	16.39	82.2	686	15.74	83.2	15.93	83.9

* A sample taken October 17 gave 16.37 per cent of sugar; purity coefficient, 84.9; average weight of beets, 527 grammes.

PLAT B.

[Distance between rows, 30 inches; between beets in the row, 10 inches.]

Date.	Dippe's Vilmorin.			Lemaire's richest.			Florimond Desprez Richest			Average sucrose in juice.	Purity coefficient.
	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.		
	Grams.	*Per ct.*		*Grams.*	*Per ct.*		*Grams.*	*Per cent.*		*Per ct.*	
Sept. 9	528	13.08	76.9	963	10.76	79.5	656	10.05	71.7	11.30	76.0
15	492	12.17	80.1	637	9.88	74.3	792	10.14	72.5	10.73	75.6
22	388	16.05	87.3	713	14.09	85.8	672	11.45	79.5	13.86	84.2
30	403	17.32	84.9	576	14.37	83.8	1,107	13.44	82.9	15.04	83.9
Oct. 7	512	16.10	84.9	712	14.56	83.5	612	12.59	79.5	14.42	83.0
16	642	17.30	84.8	1,049	14.52	80.0	887	13.80	81.6	15.21	82.1
24	540	15.57	84.7	731	14.98	83.2	886	12.83	78.7	14.45	82.2
Nov. 1	588	15.74	86.0	1,031	16.32	82.8	905	14.84	82.4	15.63	83.7

Perfectly representative samples were not always secured, as will be seen, but the analyses show nevertheless in a general way the change in the sugar content of the juice and its purity with the advance of the season. The last series of determinations for both plats were made at harvesting time; the results given for this State (November 1) are the averages of three samples of beets, of four each, taken from different parts of the plat, the beets being average sized and, as nearly as could be, representative ones. The beets reached full maturity, as may be inferred from the above table, from September 30 to October 7; after that time the percentage of sugar in the beets remained about stationary. As regards the possible yield at that early period we have no data to judge from except that the weights of the beets sampled might indicate that there was no material increase after that period.

As the varying percentages found at the different periods doubtless stand in a definite relation to the rainfall, we give below the days on which rain fell at this place between September 1 and November 1:

Rainfall at Madison, Wis., September and October, 1890.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
	Inches.		*Inches.*		*Inches.*		*Inches.*
Sept. 3	0.18	Oct. 9	0.56	Sept. 25	0.08	29	trace
4	1.81	11	0.64	26	trace	31	0.01
6	trace	12	0.98	Oct. 1	0.03	....	....
7	0.02	13	0 52	2	0.23	....	....
12	trace	15	0.23	3	trace	....	....
15	0.38	16	trace	4	0.08	....	....
17	trace	18	0.72	5	trace	....	....
18	trace	25	0.31	6	0.12	....	....
19	0.15	26	trace	7	0.16	....	....

DATA OBTAINED AT HARVESTING TIME.

[October 30 to November 1.]

The area taken up by each variety and the yield of beets as ascertained at harvesting time are given here:

Variety.	Area grown.	Yield.	Sugar in the juice.
Plat A:	*Sq. feet.*	*Pounds.*	*Per cent.*
Dippe's Vilmorin	2,470	3,040	16.76
Bulteau Desprez Richest	8,352	11,804	14.81
Simon Legrand	26,375	27,866	16.39
Klein Wanzlebener	28,750	25,650	15.74
Plat B:			
Dippe's Vilmorin	13,311	11,920	15.74
Lemaire's Richest	22,264	21,006	16.32
Florimond Desprez Richest	20,685	24,844	14.84

A good deal of dirt adhered to the beets as they were weighed. In order to ascertain the yield per acre of washed beets, a basketful of each load of beets was taken out and weighed, each variety being kept by itself; when all loads from each variety had been taken from the field, the beets taken out were all carefully washed, dried, and weighed. In this way the percentages of dirt adhering to the beets were ascertained, as follows:

	Per cent.
Plat A:	
Vilmorin	24.79
Bulteau Desprez	15.70
Simon Legrand	13.10
Klein Wanzlebener	12.11
Plat B:	
Vilmorin	24.23
Lemaire	15.70
Florimond Desprez	10.52

Basing calculations on these figures, we obtain the following yields per acre of washed beets of each variety:

Yield of washed beets.

	Pounds.
Plat A (beets 20 by 8 inches apart):	
Vilmorin	40,420
Bulteau	51,900
Simon Legrand	39,930
Klein Wanzlebener	34,150
Plat B (beets 30 by 10 inches apart):	
Vilmorin	29,430
Lemaire	34,630
Florimond Desprez	46,710

The data on hand are insufficient to determine the actual yield of sugar per acre in case of each variety. On the supposition that all varieties contained approximately the same percentage of juice, they would rank as follows as regards their sugar-producing capacity: 1. Bulteau Desprez; 2. Vilmorin (plat A); 3. Florimond Desprez; 4. Simon Legrand; 5. Klein Wanzlebener; 6. Lemaire; 7. Vilmorin (plat B).

QUANTITY OF TOPS OBTAINED FROM BEETS.

The tops from a number of beets were weighed separately when the first determination was made, September 5, and also at harvesting time, to obtain some data as regards the proportionate increase of the beet root with the period of growth, and also the relation of leaves to roots with the different varieties.

Proportion of washed roots to leaves.

	Roots : leaves as 100 :
Plat A:	
Vilmorin, September 5	60
November 1	34
Bulteau Deprez, September 5	132
October 31	17
Simon Legrand, September 5	68
October 30	23
Klein Wanzlebener, September 5	79
November 1	—
Plat B:	
Vilmorin, September 9	84
November 1	37
Lemaire, September 9	79
November 1	36
Florimond Desprez, September 9	66
November 1	36

As has always been found, the proportion of leaves is larger in the earlier stages of growth. Between the different varieties there is some difference, Bulteau Desprez and Simon Legrand White Improved containing a smaller proportion of leaves at the time of harvesting than the other varieties.

Summing up the discussion of the work for the last season it is noticed that the yield of sugar beets obtained as well as their sugar content was very satisfactory; the season could not be considered favorable to sugar-beet culture on account of the heavy rains in the fall. When, in spite of this, crops were secured of 15 to 25 tons per acre of beets, containing a good percentage of sugar, it would seem that the question whether or not sugar-beet culture may prove profitable can not be answered in any other way than the affirmative.

WORK DONE AT SUB-STATIONS.

Five sub-stations were established in different parts of the State to study the adaptability of the different regions to sugar-beet culture. The names of the farmers who undertook the work with their addresses are F. W. Roberts, Woodworth, Kenosha County; Paul M. Peirce, Germania, Marquette County; Fred. Burton, Janesville, Rock County; L. F. Noyes, Hudson, St. Croix County; A. L. Grengo, Colgate, Waukesha County.

Of these stations three lie in the southern portion of our State, viz: Woodworth, near Lake Michigan; Janesville at about the same latitude in the inner part of the State; and Colgate about 20 miles west of Milwaukee. Germania lies in the central portion of the State, about 50 miles north of Madison; Hudson lies in the northwestern corner of the State, about 10 miles east of St. Paul (at 45° latitude).

Directions were sent to select a small piece of land, about 3 square rods, of a kind that would be favorable to a good crop of potatoes; to give the beets good cultivation, and to keep careful notes as regards labor spent and method of planting and cultivation. The following varieties were sent to each sub-station: Bulteau Desprez Richest, Simon Legrand's White Improved, and Dippe's Klein Wanzlebener. The data as to the kind of soil, time of planting, etc., are given in the following table:

Data concerning sub-stations.

Name of sub-station.	Kind of soil.	Planted to each variety.	Previous crop on land.	Date of planting.	Distance between rows.	Distance between beets after last thinning.	Time spent in cultivating and thinning.	Date of harvesting.
		Sq. ft.			*In.*	*In.*	*Hrs.*	
Woodworth, Kenosha Co.	Light sandy	797	Potatoes	May 29	18	4–6	24	Oct. 28
Germania, Marquette Co.	Loam	550	Clover	May 19	18	6	45	Oct. 28
Janesville, Rock Co	Black loam	817	Pasture	May 15	20	6	37	Oct. 28
Hudson, St. Croix Co	Black sandy	817	Oats	May 19	18	(*)	20	Oct. 29
Colgate, Waukesha Co.	Clay loam	1,224	Timothy	May 31	18	8	54	Nov. 16

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* Simon Legrand, 16 inches; Klein Wanzlebener, 12 inches; Bulteau Desprez Richest, 20 inches. Seed did not all grow, hence the great distance between beets in the row.

In order to study the development of the beets at each place, during the fall four samples of each variety grown were secured from each station between the middle of September and the date of harvesting. On the arrival of the samples at the station they were weighed and the juice polarized. The results of the examinations are given in the following table.

Sugar beets from substations.

1. FROM F. W. ROBERTS, WOODWORTH, WIS.

Date.	Bulteau-Desprez Richest.			Simon Legrand White Improved.			Dippe's Klein-Wanzlebener.		
	Average weight of beets.	Sugar in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.	Average weight of beets.	Sucrose in juice.	Purity coefficient.
	Grams.	*Per ct.*		*Grams.*	*Per ct.*		*Grams.*	*Per ct.*	
Sept. 18	237	10.72	77.7	455	10.69	80.3	461	12.37	85.3
Oct. 8	458	10.26	75.3	476	12.51	81.2	451	12.91	81.5
" 15	782	9.87	74.9	586	11.77	80.7	816	11.96	79.5
" 30	614	12.81	79.6	578	12.87	78.9	585	13.45	79.6

2. FROM PAUL M. PEIRCE, GERMANIA, WIS.

Sept. 23	325	12.04	80.8	463	12.70	80.1	381	13.93	91.7
Oct. 7	248	12.98	83.1	546	13.41	82.8	555	13.84	85.4
" 18	682	13.58	85.7	428	13.05	82.2	796	13.27	81.9
Nov. 4	722	13.79	83.2	783	13.68	83.2	832	15.50	84.9

3. FROM FRED. BURTON, JANESVILLE, WIS.

Sept. 25	608	15.24	85.1	561	14.14	83.2	687	13.75	77.2
Oct. 8	438	16.00	80.2	418	15.08	82.6	421	14.40	81.9
" 17	483	13.17	83.0	581	15.29	79.8	672	13.80	82.3
Nov. 7	551	14.77	85.2	516	13.04	82.8	479	14.31	83.1

4. FROM L. F. NOYES, HUDSON, WIS.

Sept. 23	197	13.14	78.2	179	13.71	82.8	208	13.91	85.3
Oct. 6	228	14.84	78.8	205	14.13	82.1	164	14.86	83.0
" 20	186	14.89	79.6	179	16.12	79.9	158	16.83	84.4
Nov. 4	203	12.99	75.5	232	13.60	79.0	243	15.44	83.5

5. FROM A. L. GRENGO, COLGATE, WIS.

Sept. 26	504	14.92	86.0	491	14.69	85.4	605	15.10	83.4
Oct. 9	667	16.25	81.4	761	15.07	80.0	1,040	14.42	81.5
" 18	632	12.53	80.7	925	12.77	80.0	1,046	12.51	79.5
Nov. 12	829	17.14	84.5	791	15.95	87.4	1,047	14.95	83.2

It would seem from this table that the beets did not improve materially at any place as far as sugar content and purity of the juice are concerned after the beginning of October. At the Janesville Substation the beets seem to have been as mature and rich on September 25 as at any time later on. At the Hudson Station the beets never grew large (weighing on the average not more than half a pound apiece), and they seem to have been about as far advanced when the first sample was taken as later on; the light yield is explained by the cold wet weather at Hudson when the seed was planted, causing the seed to rot; potatoes planted there at the same time also rotted.

The mean temperature and rainfall at St. Paul during the past season and normally were as follows:

Meteorological data for St. Paul, Minn., May to October, 1890.

Months.	Temperature.		Rainfall.	Normal rainfall.
	Mean.	Mean normal.		
	°F.	*°F.*	*Inches.*	*Inches.*
May	52.2	58.4	3.66	3.34
June	69.8	67.1	5.29	4.85
July	71.9	71.6	1.87	3.26
August	65.0	69.5	2.20	3.67
September	58.2	58.9	2.73	3.38
October	46.0	47.1	2.79	2.05
Total	....	....	18.54	20.55

The other stations produced beets of average size, with a good to fair percentage of sugar. The yields of beets at the different places may be seen from the following table, and also the estimated yield per acre:

Sugar beets from substations.

Name.	Bulteau Desprez.				Simon Legrand.				Klein Wanzlebener.			
	Area grown.	Yield of beets.	Sugar in juice.	Yield per acre.	Area grown.	Yield of beets.	Sugar in juice.	Yield per acre.	Area grown.	Yield of beets.	Sugar in juice.	Yield per acre.
	Sq. ft.	*Lbs.*	*Perct.*	*Lbs.*	*Sq. ft.*	*Lbs.*	*Perct.*	*Lbs.*	*Sq. ft.*	*Lbs.*	*Perct.*	*Lbs.*
F. W. Roberts, Woodworth	796.75	1,095	11.81	59,880	796.75	915	12.87	50,010	796.75	1,075	13.45	58,790
P. M. Peirce, Germania	550.00	410	13.79	32,470	550.00	200	13.68	15,840	550.00	610	15.50	48,310
Fred Burton, Janesvillo	816.75	600	14.77	32,000	816.75	486	13.04	25,880	816.75	575	14.31	30,670
L. F. Noyes, Hudson	816.75	163	12.99	8,694	816.75	174	13.60	9,279	816.75	185	15.44	9,868
A. L. Grengo, Colgate	1,224.00	2,093	17.14	77,470	1,224.00	1,851	15.95	67,410	1,224.00	2,146	14.95	76,370

In judging these results, it must be remembered that the area grown was small, and hence the yield per acre must be taken only as an indication of what might be reached under very favorable conditions. The yield found at the Colgate substation is higher than that of any of the other stations, going even up to 38 tons in case of Bulteau Desprez Richest and following closely with the other varieties. The yield of beets as well as their richness may be pronounced satisfactory in all cases except in case of the Hudson station, where the yield was very light, for reasons already stated. The climatic conditions of the four Southern stations probably did not vary very much from those of Madison, which have been previously given.

As it was deemed of some interest, the weights of leaves were ascertained at harvesting time along with those of the beets. In the following table are given the percentage weights of leaves, calculated on weight of beets:

Relation between tops and beets at substations.

Substation.	Bulteau Desprez Richest.	Simon Legrand White Imp.	Dippe's Klein Wanzlebener.
	Weight of beet root: weight of tops as 100:		
Germania, Marquette Co	67	60	50
Woodworth, Kenosha Co	55	52	63
Janesville, Rock Co	54	70	67
Hudson, St. Croix Co	40	34	41
Colgate, Waukesha Co	55	59	58
Average	54	55	56

EXAMINATION OF BEETS FROM FARMERS IN DIFFERENT PARTS OF THE STATE.

It remains to give an account of the work done during the past season in analyzing sugar beets grown by farmers in different parts of the State, the seeds having been mostly obtained, either directly or indirectly, from the U. S. Department of Agriculture. Realizing the importance of the sugar-beet problem and the widespread interest in its solution, this station had notices published in all newspapers in the State offering to analyze free of charge beets grown anywhere in the State. As a result, 70 farmers in 28 counties of the State sent in samples of sugar beets for analysis. The results are given in the following table, along with such information about the beets as it was possible to obtain—variety, soil, time of planting and harvesting, etc.:

Sugar beets in Wisconsin, season 1890, *arranged alphabetically according to counties.*

Number.	Name of grower.	Post-office.	County.	Variety.	Seed obtained from—	Time of planting.	Time of harvesting.	Soil.	Average weight of beets.	Solids in juice.	Sugar in juice.	Purity coefficient.	Remarks.
									Grams	*P. ct.*	*P. ct.*		
1	John B. Meyer	Modena	Buffalo	White Siberian	S. Wilson, Mechanicsville, Pa.	May 3	Oct. 20	Black prairie	1,135	14.48	10.29	71.2	
2	Henry N. Petersen	New Holstein	Calumet	Klein Wanzlebener.	U. S. Department Agriculture.	Mid. May	Oct. 23	Black loam	402	21.40	17.91	83.7	
3	Herm. Kroehnke	...do	...do		...do	May 20	Nov. 5	Loam	549	18.60	16.20	87.1	
4	Claus Edens	...do	...do	Klein Wanzlebener.	...do	May 20	Nov. 1	Dark loam	415	21.05	18.40	87.4	8 inches apart, rows 16 inches apart.
5	Aug. A. Paulson	...do	...do	...do	...do	June 15	Nov. 1	Clay	265	22.15	18.79	84.9	Unmanured.
6	Dr. E. F. Russell	Poynette	Columbia	Florimond	Wisconsin Experiment Station.	June 4	Oct. 3	Heavy clay	924	15.40	11.68	75.8	Do.
7	...do	...do	...do	...do	...do	June 5	Sept. 30	Prairie	321	15.52	9.97	64.2	Do.
8	...do	...do	...do	...do	...do	June 7	Oct. 1	Sandy loam	669	16.20	13.00	80.1	Do.
9	...do	...do	...do	...do	...do	June 5	Sept. 30	Prairie	853	15.85	10.95	69.1	Do.
10	W. R. Chipman	Leeds Center	...do	...do	...do	May 31	Oct. 27	Black loam	1,833	15.85	12.59	81.4	Barnyard manure.
11	...do	...do	...do	...do	...do	May 31	Oct. 27	...do	867	16.20	12.86	79.5	Unmanured.
12	D. L. Cuff	Rocky Run	...do	...do	...do	June 10	Oct. 15	Sandy loam	1,729	15.52	11.59	74.9	
13	H. P. Johnson	Columbus	...do	Vilmorin	...do	June 1	Nov. 1	Clayey	1,040	17.80	14.74	82.8	Do.
14	Wm. Strhemil	...do	...do	...do	...do	June 1	Nov. 1	Black loam	2,524	15.05	10.93	72.7	Do.
15	R. K. Beecham	Sun Prairie	Dane	Unknown	Jas. Vick, Rochester, N. Y.	June 1	Oct. 10	Puttor heavy clay.	1,415	11.65	8.26	70.9	Do.
16	...do	...do	...do	...do	...do	June 1	Oct. 10	...do	1,224	11.05	8.18	74.0	Do.
17	Leslie Wright	Danville	Dodge	Vilmorin	Wisconsin Experiment Station.	May 28	Oct. 13	Yellow sandy loam.	1,622	12.88	8.84	70.8	
18	F. C. Cooper	...do	...do	...do	...do	May 29	Oct. 13	Yellow clay loam.	1,609	15.28	12.13	79.5	Unmanured.
19	John Weston	Burnett	...do	Florimond	...do	May 30	Oct. 29	Black loam	298	15.05	11.07	73.6	Barnyard manure.
20	Aug. Woinowsky	Menomonie	Dunn	White Imperial	John Salzer, La Crosse, Wis.	May 30	Oct. 10	Sandy loam	866	12.94	9.45	73.0	Unmanured.
21	Aug. Peter	...do	...do	...do	...do	May 17	Oct. 11	...do	643	15.86	12.56	79.2	Do.
22	Sam. Welke	Fall Creek	Eau Claire	...do	...do	May 5	Oct. 20	Fine sandy loam mixed with clay.	1,011	12.48	7.91	63.4	Barnyard manure.
23	H. D. Hitt	Oakfield	Fond du Lac	Florimond	Wisconsin Experiment Station.	May 29	Oct. 2	Heavy clayed loam.	850	17.19	12.84	74.7	Do.
24	Wm. Merrell	Oak Centre	...do	Globe Sugar	Bryce & Furgeson, Waupaca.	May 30	Oct. 28	Clay loam	1,283	11.42	7.89	69.1	Raised for stock.

Sugar beets in Wisconsin, season 1890, arranged alphabetically according to counties—Continued.

Number.	Name of grower.	Post-office.	County.	Variety.	Seed obtained from—	Time of planting	Time of harvesting.	Soil.	Average weight of beets.	Solids in juice.	Sugar in juice.	Purity coefficient.	Remarks.
									Grams	*P. ct.*	*P. ct.*		
25	John H. Wise	Platteville	Grant	Florimond	Wisconsin Experiment Station.	May 31	Oct. 20	Black loam	719	14.48	10.16	70.3	Barnyard manure.
26	do	do	do	do	do	June 9	Oct. 20	Newly broken timber soil.	966	10.92	6.48	59.3	Unmanured.
27	do	do	do	do	do	June 2	Oct. 20	Black loam	1,435	11.42	6.82	59.7	Do.
28	Geo. M. Thomas	Mineral Point	Iowa	do	do	June 12	Oct. 16	Black soil	620	16.78	13.19	78.6	Do
29	do	do	do	do	do	June 12	Oct. 16	do	650	15.62	12.30	80.6	Do.
30	Geo. E. Kelly	do	do	do	do	May 24	Nov. 1	Clay	590	15.62	11.98	76.7	Do.
31	do	do	do	do	do	May 24	Nov. 1	Garden soil	838	15.40	11.52	74.8	Barnyard manure.
32	R. Crossfield	Fort Atkinson	Jefferson	Vilmorin	do	May 29	Oct. 1	Clay loam	498	16.90	12.94	76.6	Unmanured.
33	Niles Deforest	do	do	do	do	June 1	Oct. 1	do	471	16.41	12.94	78.8	Do.
34	John B. Millard	Lake Mills	do	do	do	June 1	Oct. 20	Heavy dark loam.	839	18.60	13.94	74.9	Do.
35	do	do	do	do	do	June 1	Oct. 20	Red clay	1,285	16.90	13.48	79.7	Do.
36	Geo. W. Kindlin	Fort Atkinson	do	Florimond	do	May 30	Oct. 6	Sandy loam	527	16.32	12.78	78.3	Barnyard manure.
37	Hon. F. A. Hoffman.	Jefferson	do	Vilmorin	Vaughan, Chicago	Apr. 29	Oct. 2	Rich clay loam	1,085	15.51	11.55	74.5	Do.
38	do	do	do	do	do	Apr. 29	Oct. 2	do	1,484	14.59	10.98	75.8	Do.
39	Peter Benz	Kewaunee	Kewaunee	do			Sept. 24	Heavy clay	1,206	17.70	13.96	78.9	
40	Frank Paula	do	do	Bohemian	Imported		Sept. 21	do	764	10.91	7.63	69.3	
41	Joseph Jetek	do	do	do	do		Sept. 24	Black clay soil	835	15.51	12.53	80.8	
42	Peter Benz	do	do	Vilmorin					800	19.95	16.38	82.1	
43	Joseph Jetek	do	do	Bohemian					918	18.38	14.80	80.5	
44	Mates Plouhar	do	do	Klein Wanzlebener.	Imported				496	18.82	16.29	86.6	
45	Frank Albrecht	do	do	do					691	17.70	14.72	83.2	
46	Anton Galenberger	do	do	do	Imported				743	16.90	13.26	78.5	
47	W. Holub	do	do	K. P	do				522	18.70	16.78	89.7	
48	A. Mattik	do	do	Bohemian	do				1,115	15.05	12.55	83.4	
49	F. Koimek	do	do	Desprez					870	16.55	13.76	3.2	
50	Rev. Bergholz	do	do	Unknown					1,480	14.25	9.98	69.4	
51	John Jellineck, jr.	do	do	do					960	21.40	17.25	80.6	
52	Math. Wochos	Stangelville	do	Desprez Richest	U. S. Department Agriculture.	May 20	Oct. 10	Sandy loam	856	20.18	17.31	85.8	Barnyard manure.
53	John Dawson	La Crosse	La Crosse	Unknown	Jos. Harris, Rochester, N. Y.	May 7	Nov. 5	Clay loam	1,531	13.18	9.85	74.7	Do.
54	Thomas Mohr	Manitowoc	Manitowoc	do	A. Landreth, Manitowoc.	May 15	Oct. 10	Black loam	663	18.70	15.24	81.5	Do.
55	do	do	do	do	do	May 15	Oct. 10	do	936	16.65	13.46	80.8	Do.
56	A. Lindner	Kiel	do						1,505	15.86	11.22	72.4	

57	Fred. Burow	West Granville	Milwaukee	Imperial	Erfurt, Germany	June 10	Oct. 25	Clay	91	418.60	16 09	86.5	Barnyard manure.
58	...do	...do	...do	Mangold	...do	June 10	Oct. 25	...do	95	318.60	16.33	87.8	Do.
59	G. H. Rawson	Oak Creek	...do	Lemaire's	Wisconsin Experiment Station.	June 1	Nov. 3	Black sandy loam.	91	718.02	15.33	85.1	Unmanured.
60	Julius Roebel	West Granville	...do	...do	U. S. Department Agriculture.	May 20	Oct. 28	Black loam	82	419.28	17.08	88.6	Do.
61	...do	...do		Florimond	...do	May 20	Oct. 28	...do	84	418.95	16.10	84.9	
62	S. Wehrmann	Binghamton	Outagamie		J. Vick, Rochester, N. Y.	May 15	Oct. 15	Black clayey	1,48	217.12	12.90	75.4	
63	E. Barkhausen	Thiensville	Ozaukee	Lemaire's	Wisconsin Experiment Station.	May 1	Oct. 19	Black sandy loam.	38	214.00	10.98	78.5	Unmanured.
64	H. Wehmhoff	Burlington	Racine	Vilmorin	...do	May 31	Oct. 9	Black sandy	86	617.22	13.86	80.5	Sheep manure.
65	F. E. Carswell	Lone Rock	Richland						2,63	310.99	6.48	59.2	
66	E. G. Snyder	Clinton	Rock	Vilmorin	Wisconsin Experiment Station.	June 7	Oct. 3	Sandy clay	38	418.60	15.17	81.5	Unmanured.
67	P. F. Newell	Jewett Mills	St. Croix	...do	...do	June 1	Oct. 18	Black loam	43	618.70	14.37	76.9	Barnyard manure.
68	M. E. Seymour	Reedsburgh	Sauk	Lane's Imperial	U. S. Department Agriculture.	May 15	Oct. 16	...do	1,35	810.1	6.39	63.3	Unmanured.
69	J. W. Wood	Baraboo	...do	Florimond	Wisconsin Experiment Station.	May 24	Oct. 3	Clay loam	81	114.70	10.92	74.3	Barnyard manure.
70	A. E. Marker	Reedsburgh	...do	French White Sugar.	T. D. Ferry & Co., Detroit, Mich.	May 15	Oct. 15	Sandy loam	1,86	412.95	8.88	68.5	Do.
71	E. A. Dwinnell	North Freedom	...do	Lane's Imperial	U. S. Department Agriculture.	May 15	Oct. 6	Clay loam	1,19	913.55	10.37	76.5	
72	S. A. McCoy	...do	...do	Imperial Sugar-beet.	...do	May 18	Oct. 8	...do	1,310	12.72	8.69	68.3	Barnyard manure.
73	Louis Ballschmieder.	Sheboygan Falls	Sheboygan	Simon Le Grand	...do	May 18	Oct. 15	Black loam	938	11.42	8.11	71.0	Unmanured.
74	...do	...do	...do	Lane's Imperial	D. M. Ferry & Co., Detroit, Mich.	May 12	Oct. 12	Sandy loam	764	11.52	8.58	74.7	Do.
75	...do	...do	...do	Klein-Wanzlebener.	U. S. Department Agriculture.	May 18	Oct. 12	Black loam	542	14.70	11.55	78.6	Do.
76	...do	...do	...do	Vilmorin	D. M. Ferry & Co., Detroit, Mich.	May 18	Oct. 16	...do	834	14.92	12.27	82.2	Do.
77	...do	...do	...do	French Yellow	Germany	May 20	Oct. 15	...do	842	11.52	8.08	70.1	Do.
78	A. J. Lamberson	Whitehall	Trempealeau	Lemaire's	Wisconsin Experiment Station.	June 10	Oct. 5	...do	1,482	16.20	12.39	76.5	Do.
79	Leslie Clark	Galesville	...do	Vilmorin	...do	June 8	Oct. 12	Black heavy soil.	770	16.20	12.86	79.4	Horse manure.
80	C. D. Wolfrem	West Bend	Washington	Florimond	...do	May 30	Oct. 7	Hard clay	823	18.60	15.77	84.7	Unmanured.
81	F. Van Rhienen	South Germantown.	...do	...do	Crete, Nebr	Apr. 28	Sept. 30	Sandy loam	1,386	17.80	14.74	82.8	Barnyard manure.
82	Mary Henrick	...do	...do	...do	...do	May 15	Oct. 16	...do	629	17.70	14.58	82.4	Do.
83	John Gebhardt	...do	...do	...do	...do	May 15	Oct. 15	...do	1,040	16.42	13.45	81.9	Do.
84	...do	...do	...do	German Unknown Variety.	Menomonee Falls.	May 15	Oct. 15	...do	1,017	14.35	11.27	78.5	Do.
85	E. L. Nehs	Menomonee Falls	Waukesha	Mangold	Germany	May 25	Oct. 17	Black loam	1,039	17.55	14.35	81.7	Unmanured.
86	Mat. Debus	...do	...do	...do		May 25	Oct. 21	...do	1,350	14.82	11.16	75.3	Do.

Sugar beets in Wisconsin, season 1890, *arranged alphabetically according to counties*—Continued.

Number.	Name of grower.	Post-office.	County.	Variety.	Seed obtained from—	Time of planting.	Time of harvesting.	Soil.	Average weight of beets.	Solids in juice.	Sugar in juice.	Purity coefficient.	Remarks.
									Grams	*P. ct.*	*P. ct.*		
87	Mat. Debus	Menomonee Falls.	Waukesha	Vilmorin	Germany	May 25	Oct. 21	Black loam	934	15.75	12.44	78.9	Barnyard manure.
88	...do	...do	...do	Imperial		May 25	Oct. 21	...do	1,323	17.35	14.12	81.4	Do.
89	John Bender	Oconomowoc	...do	Lemaire's	Wisconsin Experiment Station.	June 5	Oct. 8	Clay loam	1,211	17.35	13.88	79.9	Do.
90	Chelsea E. Jones	North Prairie	...do	Vilmorin	...do	May 29	Oct. 14	Sandy	1,020	16.20	13.03	80.4	Do.
91	Chas. Churchill	Waupaca	Waupaca	Lemaire's	...do	June 1	Oct. 13	Loam	1,031	15.75	12.54	79.6	Unmanured.
92	B. L. Tayler	Iola	...do	...do	...do	May 10	Oct. 15	Clayey loam	1,324	17.35	13.82	79.7	Barnyard manure.
93	R. H. Fisher	Oshkosh	Winnebago	Imperial Sugar	Jno. A. Salzer, La Crosse.	May 12	Oct. 31	Black loam	875	16.20	12.30	76.0	Do.

The above analyses of sugar beets grown in this State during the last season have a very wide range, viz, from 6.39 to 18.79 per cent of sugar in the juice; of the 95 analyses given in the above table, 19 come below 10 per cent of sugar, 56 come above 12 per cent, 38 above 13 per cent, and 16 above 15 per cent of sugar in the juice. But very few of the farmers who sent in beets for analysis had previously had any experience in growing beets; besides this some of the beets were grown for stock food, with no intention of testing their sugar-producing capacity. Bearing this in mind, it would seem that the showing is a very creditable one; where grown for sugar, and where good care was bestowed, the beets contained a high percentage of sugar. As regards the yield, but very few and uncertain data were obtained, most of the farmers having grown only small plats, from which an estimated yield was reported.

Of the different portions of the State, the eastern region seems better adapted for sugar-beet culture than the western, as far as the data on hand will enable us to judge about the matter. Judging from the data obtained, which are of course very limited, it may further seem that three regions may prove especially well adapted for the culture of sugar beets of the localities from which beets were received during the past season, viz, the country around New Holstein, Calumet County, (latitude about 44°); around South Germantown, Washington County, and around Kewaunee, Kewaunee County (latitude 44.5°). The average of all analyses from New Holstein was found to be the very high figure of 17.83 per cent of sugar in the juice; the average for South Germantown was 13.51 per cent, and for Kewaunee 13.85 per cent (of the fourteen samples received from this locality, twelve came above 12 per cent, and seven above 14 per cent of sugar in the juice). Also other localities may prove well adapted for sugar-beet culture, which have not yet been investigated outside of our substations, *e. g.*, the counties of Rock, Jefferson, Waukesha, Washington, Milwaukee, and Ozaukee, in short the whole eastern portion of the State.

A continued study of this subject may disclose other sections where sugar-beet culture may be conducted successfully. The work has just been entered upon. From what has been done at this experiment station and at substations in different parts of the State, it is known that good crops of beets can be grown of a good quality. While the results reached so far would indicate that Wisconsin may prove well adapted for the culture of sugar beets, the work must be repeated for several seasons before the question can be considered as fully settled.

EXPERIMENTS WITH SUGAR BEETS AT FORT SCOTT, KANSAS.

Quite a number of samples of beets was analyzed at Fort Scott with the following results:

In the juice.

Date.	Total solids.	Sugar.	Purity.	Date.	Total solids.	Sugar.	Purity.
	Per cent.	*Per cent.*			*Per cent.*	*Per cent.*	
Sept. 26	....	....	... .	Nov. 1	15.0	12.2	81.3
Oct. 8	13.13	9.6	73.11	Nov. 1	15.4	12.8	83.1
Oct. 15	15.5	11.5	74.2	Nov. 1	16.8	12.2	72.6
Oct. 18	18.17	13.7	75.4	Nov. 1	15.7	11.7	74.5
Oct. 18	13.84	10.25	74.1	Nov. 1	16.6	13.7	82.5
Oct. 23	13.54	9.5	70.9	Nov. 1	15.7	12.9	82.2
Oct. 23	15.17	12.5	82.4	Nov. 1	19.1	16.7	87.4
Oct. 31	14.85	11.5	77.4	Nov. 1	14.4	11.1	77.7
Nov. 1	15.8	13.25	83.8	Nov. 1	14.0	10.6	75.7

A few of these samples showed good qualities for sugar making, but the most of them had too low a content of sugar and purity to be of any value for the manufacture of sugar.

ANALYSES OF BEETS AT THE AGRICULTURAL DEPARTMENT STATION OF MINNESOTA.

Prof. D. F. Harper, chemist of the station, has furnished me with the following analyses of beets made at that station.

The character of the beets for sugar-making purposes is fairly good:

Varieties.	Brix.	Sugar.	Purity.
	Per cent.	*Per cent.*	
Dippe's Vilmorin	17.10	14.01	81.93
Bult. Desprez's Richest	16.02	14.07	87.89
Simon Legrand's White Improved	17.60	14.83	84.26
Vilmorin's White Improved	15.00	12.17	81.13
Vilmorin	15.95	12.42	77.87
Gregory White Sugar	15.90	12.55	78.93
Lane's Improved	15.86	11.15	73.45
Vilmorin's White Improved	13.72	10.06	79.86
Dippe's Klein-Wanzlebener	15.92	13.04	81.91
Excelsior	15.55	12.26	78.84
Florimond Desprez's Richest	17.24	13.42	77.84
Improved Imperial	14.48	11.45	79.07

EXPERIMENTS WITH SUGAR BEETS AT TOPEKA, KANSAS.

Quite a quantity of beets was brought to the factory at Topeka, and an experimental run was made with them. The number of tons of beets used was 22. The juice from the samples of beets entering the battery was found to contain 15.36 per cent. of total solids and 9.30 per cent. of sugar.

It will be noted by the above figures that the quality of the beets was worthless for sugar-making purposes.

EXPERIMENTS WITH SUGAR BEETS AT MEDICINE LODGE, KANSAS.

In addition to the analyses and control of the sorghum sugar work extensive examinations were made of the beets growing in the locality of Medicine Lodge.

The season was a peculiar one for beets. At the commencement of the rains on the 28th of August the beets were scarcely at all developed and were regarded as a total failure. After the rains commenced the beets grew rapidly and continued to grow vigorously through the months of September and October. About the middle of November the harvesting of the beets was commenced and continued until December. At that time the beets had reached a fair size and developed a high content of sugar. Two hundred and sixty-one wagonloads were brought to the factory and large samples were taken from each of these loads and subjected to analysis. The means of 261 analyses follow:

In the juice.

Total solids	per cent	18.52
Sucrose	do	15.12
Purity		81.04

Four hundred and eleven miscellaneous analyses of the beets from different plots in the vicinity of Medicine Lodge were made with the following mean results:

In the juice.

Total solids	per cent	17.80
Sucrose	do	13.20
Purity		75.60

The fresh chips entering the battery had a mean sucrose content in the juice of 13.90 per cent, much less, as will be noted, than that represented by the analyses from the different loads.

The diffusion juices show a content of 10.45 per cent sucrose, and a purity of 81.2.

The working of the beets with the sorghum-sugar machinery was extremely slow, and either from this cause or from the method of liming, which was very heavy without any subsequent use of carbonic acid, the clarification and boiling of the juices became a matter of great difficulty, and they suffered in this process rapid deterioration; for instance, the purity of the clarified juice was only 78.8 and of the sirup 78.3, while the mean purity of the massecuites showed the enormous depression represented by the difference between 78.8 and 59.4. The actual cause of this remarkable deterioration in boiling is not well understood. The juices boiled with the greatest difficulty, it being almost impossible to prevent them from foaming in the pan. The semisirups also, after standing for a time, deposited a large quantity of mucus or viscous material, and this would lead to the supposition that a pernicious fermentation of a viscous or mannitic nature was the cause of the great loss of sugar during the boiling operations.

It is evident at once that the attempt to make beet sugar without appropriate apparatus must be regarded as futile. Beets of the quality of those delivered at the Medicine Lodge factory, if they had been properly and promptly manufactured, would have yielded almost 250 pounds of sugar to the ton; instead of this the yield was extremely small, the separation from the massecuite very difficult, and the whole manufacturing process disappointing.

In regard to the probability of producing beets in the locality of Medicine Lodge, I am still of the opinion, expressed in Bulletin No. 27, that it is a locality too far south to expect the successful culture of the sugar beet. In using the term "too far south" it is not meant in an absolute sense, but too far south from the zone of the probable beet industry as indicated in the map given in Bulletin No. 27. The actual growing season at Medicine Lodge, it will be noticed, was not during the summer, but in the autumn after the rains fell and the weather had become cool. Had the early part of the season been wet enough to secure a growth of the beets it is hardly probable that they would have shown the high content of sugar which they did. The splendid results obtained at Medicine Lodge in the working of sorghum cane would seem to indicate the course which the sugar industry should follow in that locality. Everything indicates that the culture of sorghum sugar will prove a success while there is little to encourage the further development of the beet-sugar industry in that locality.

ANALYSES OF BEETS AT MEDICINE LODGE.

The following analyses show the character of the beets examined at Medicine Lodge during the months of November and December, 1890. As has been stated, the character of the season at Medicine Lodge was peculiar. On September 25 the beet crop was a total failure. Owing to the extremely dry summer the beets had not grown and were but little larger than a cigar. After that date copious rains with other favorable climatic conditions induced a rapid growth and produced by November a small crop of beets of exceptional richness in respect of sugar content. The data will illustrate in full the character of the juice of the beets. The general data of the season precede the details in the tables.

Analyses of beets—General data.

	Total solids.	Sucrose.	Purity.
Exhausted chips	1.20	.25	....
Fresh chips	17.31	13.90	80.3
Diffusion juice	12.84	10.45	81.2
Clarified juice	13.65	10.80	78.8
Semi-sirup	43.00	31.95	78.3
Massecuite	86.90	51.64	59.4
Marc ... per cent	5.11	....	....
Press cake	....	1.53	....
Extraction	....	98.1	....
Dilution	....	27	....
Sugar	....	87.0	....
Beets worked ... tons	....	293	....
Harvested ... acres	....	70	....

Date.	Fresh chips.			Diffusion juice.			Clarified juice.		
	Solids.	Sucrose.	Purity.	Solids.	Sucrose.	Purity.	Solids.	Sucrose.	Purity.
	Per cent.	*Per cent.*		*Per cent.*	*Per cent.*		*Per cent.*	*Per cent.*	
Nov. 23	17.33	13.90	80.37	12.80	9.71	76.02	13.63	9.93	73.02
24	17.03	14.20	83.52	13.03	10.11	79.82	14.07	12.43	*88.43
25	17.62	13.92	79.92	12.67	10.86	85.21	13.24	10.99	82.86
26	17.17	13.70	80.14	12.87	11.03	84.97	13.73	11.37	82.51
28	17.27	12.96	44.98	12.93	11.01	84.83	13.84	11.43	82.60
Dec. 2	18.09	14.11	78.39	11.99	10.22	85.43	14.00	10.67	75.72
3	17.03	13.96	81.81	13.00	10.30	79.11	14.07	10.68	75.69
5	17.00	13.97	81.83	12.97	10.67	82.21	13.82	10.99	78.92
6	17.25	14.38	83.16	13.31	10.14	76.82	12.45	9.38	75.23
Means	17.31	13.90	80.31	12.84	10.45	81.26	13.65	10.80	78.86

* Sorghum sugar melted in juice.

Date.	Semi-sirup.			Exhausted chips.		Press cake.
	Solids.	Sucrose.	Purity.	Solids.	Sucrose.	Sucrose.
	Per cent.	*Per cent.*		*Per cent.*	*Per cent.*	*Per cent.*
Nov. 23	44.17	32.16	72.91	1.20	.23	1.62
24	46.19	41.19	*89.38	1.32	.30	1.57
25	42.11	29.11	69.98	1.16	.22	1.55
26	43.76	29.16	67.93	1.19	.22	1.42
28	44.11	31.11	70.55	1.27	.24	1.48
Dec. 2	39.24	29.12	74.28	1.22	.26	1.46
3	39.90	29.13	73.00	1.19	.24	1.49
5	42.27	30.11	71.32	1.22	.24	1.64
6	46.00	35.46	77.09	1.16	.30	1.54
Mean	43.00	31.95	74.30	1.20	.25	1.53

* Sorghum sugar added.

Date.	Massecuite.			Sugar. (sucrose)
	Solids.	Sucrose.	Purity.	
	Per ct.	*Per ct.*		*Per ct.*
Dec. 1	87.14	51.02	58.57	86.8
Dec. 8	86.70	52.26	60.27	87.2
Mean	86.92	51.64	59.42	87.0

	Per cent.
Marc	5.11
Extraction	98.1
Dilution	27.0

Miscellaneous analyses of beets.

[In the juice.]

Date.	Solids.	Sucrose.	Purity.	Description of samples from—
	Per cent.	*Per cent.*		
July 15	20.50	16.83	82.02	J. H. McCracken.
16	21.53	16.77	76.82	M. Best.
17	21.53	16.54	76.53	Hy. Hinze.
20	19.87	15.75	79.23	P. B. Cole.
24	18.90	15.20	80.43	George Heydenrick.
Aug. 1	14.50	9.45	65.33	Mullen; tops destroyed by web worms.
6	17.73	13.45	73.44	J. H. McCracken.
6	17.03	13.60	80.03	George Mawson.
9	14.20	10.81	76.11	Neligh, Nebraska.
Sept. 1	11.00	7.10	64.14	K. Lammerman.
1	17.10	12.87	74.90	Hy. Hinze.
1	15.63	11.95	76.25	S. B. Hunt; from middle of plot.
1	15.10	15.70	78.75	S. B. Hunt; from outside of plot.
6	15.23	11.14	73.52	Neligh, Nebr.
6	12.13	8.15	66.93	L. Clovis, Wanzlebener.
6	13.03	8.40	64.97	L. Clovis, Vilmorin.
10	15.03	11.25	74.70	George Mawson.
10	13.00	9.25	70.80	M. Best.
10	13.47	9.30	70.10	Do.
10	17.53	13.20	75.42	A. R. Moore.
11	15.83	11.60	73.40	T. Bennings, Wanzlebener.
11	16.00	11.80	73.80	T. Bennings, Vilmorin.
15	12.20	7.90	64.98	K. Lammerman.
15	14.17	11.95	83.39	W. W. S. Snoddy.
15	9.57	7.15	74.73	G. H. Moore.
15	14.17	8.20	58.16	K. Lammerman.
18	16.93	12.55	73.95	A. L. Duncan.
18	15.80	12.00	75.90	John D. Fleming.
18	16.00	11.15	73.62	O. Coyle.
20	13.80	9.45	68.11	W. Helget.
21	17.43	13.05	75.25	A. R. Moore.
23	17.80	11.05	60.72	J. H. McCracken.
25	17.67	9.10	55.02	Osborn.
25	17.37	10.40	60.18	E. Wennet.
25	17.63	9.95	57.69	Dobbs Bros.
25	15.87	8.90	55.39	L. Clovis, Wanzlebener.
25	17.03	9.83	56.86	Do. Vilmorin.
25	16.00	10.95	68.03	Mullen; tops destroyed by web worms.
27	18.37	11.75	63.85	W. Schmidt.
27	18.37	12.65	69.48	A. W. Smith.
27	18.63	12.25	66.30	George Heydenrick.
27	20.30	12.15	59.35	A. R. Moore.
27	18.07	12.60	69.27	Do.
30	17.87	10.95	62.21	C. H. Blackford.
Oct. 1	16.09	11.60	68.78	A. W. Smith.
1	18.10	13.05	72.10	Hy. Hinze.
3	21.43	16.85	78.00	J. H. McCracken.
3	18.63	12.55	67.64	W. Helget.
6	17.20	12.00	69.86	Osborn.
6	19.60	13.45	68.62	Do.
6	17.47	11.20	63.67	T. Bennings, Wanzlebener.
6	17.53	11.70	66.14	T. Bennings, Vilmorin.
6	17.80	10.70	59.92	J. B. Cool.
6	18.60	12.80	67.69	Rice.
6	18.37	13.90	74.01	A. W. Smith; dark ground.
9	17.54	13.60	78.70	O. Coyle; non-alkali soil.
9	15.83	12.05	75.90	O. Coyle; alkali soil.
9	17.80	12.75	71.20	A. L. Duncan.
12	15.10	11.70	78.75	J. H. McCracken.
12	17.37	12.75	73.99	P. B. Cole.
12	19.20	13.60	69.00	M. Best.
12	20.67	15.85	73.76	Do.
15	19.10	12.20	62.03	Hy. Hinze.
15	19.77	14.80	72.21	M. H. Sparks.
15	19.10	12.20	62.03	F. F. Mullen; tops destroyed by web worms.
15	16.87	10.80	63.26	Osborn.
15	16.83	10.55	62.16	J. D. Flemming; average size.
15	16.30	9.90	59.38	J. D. Flemming; large beets.
15	18.37	11.75	64.49	J. D. Flemming; small beets.
15	18.40	10.75	63.39	A. L. Duncan.
15	16.00	11.40	71.88	K. Lammerman.
17	17.83	11.15	63.13	Geo. Heydenrick.
17	18.60	11.75	63.51	Do.
17	18.17	12.15	66.00	W. Schmidt.
17	16.97	10.85	59.56	L. Clovis.
17	15.83	8.75	54.11	Do.
17	20.97	13.20	63.07	A. W. Smith.

Miscellaneous analyses of beets—Continued.

Date.	Solids.	Sucrose.	Purity.	Description of samples from—
	Per cent.	*Per cent.*		
Oct. 17	19.03	11.50	60.62	T. Bennings.
17	19.27	12.55	63.25	Do.
19	19.43	11.70	59.95	K. Lammerman.
19	17.80	10.70	59.92	Do.
19	19.40	11.95	61.31	S. B. Hunt.
19	17.67	11.70	66.14	
19	15.77	9.80	62.14	Rice.
19	17.50	11.20	63.67	Hartzell.
20	15.47	9.70	61.40	Dobbs Bros.
22	17.07	11.10	63.90	A. R. Moore.
22	20.47	11.70	54.66	J. H. McCracken.
22	17.67	11.35	64.43	A. R. Moore; roots.
22	17.80	10.95	62.21	A. R. Moore; tops of roots above ground.
22	18.58	11.70	58.41	O. Coyle.
22	20.30	12.15	59.35	J. D. Flemming; roots
22	17.57	11.00	62.75	J.D. Flemming; tops of roots above ground.
24	19.33	12.30	63.81	W. Welget.
24	18.50	11.60	61.44	Blackford.
24	19.07	12.25	64.77	F. F. Mullen; tops destroyed by web worms; new tops appeared.
26	17.77	10.55	59.30	Underwood.
26	18.50	11.85	64.05	P. B. Cole.
26	17.30	10.75	62.25	Geo. Mawson.
28	19.80	12.75	64.39	J. B. Cool.
28	19.03	15.85	83.19	Geo. Heydenrick.
28	19.09	12.55	64.92	J. H. McCracken.
28	19.77	12.90	65.66	Do.
28	18.67	11.40	61.72	K. Lammerman.
28	17.43	11.25	64.88	Do.
28	16.93	12.50	73.95	M. H. Sparks.
28	19.63	13.95	71.98	Hy. Hinze.
29	17.57	11.30	62.97	E. Wennet.
29	18.43	11.25	61.61	Do.
29	18.37	11.40	62.06	S. B. Hunt.
29	19.83	12.80	64.55	Dobbs Bros.
29	16.17	8.90	51.94	G. H. Moore.
29	19.78	13.05	63.95	Dobbs Bros.
30	18.46	11.90	64.69	Hartzell.
30	17.27	11.50	68.81	Do.
30	19.47	13.70	70.42	Blackford.
30	18.47	13.43	72.82	Do.
31	17.87	12.20	67.71	L. Clovis.
31	18.37	12.30	66.96	Do.
31	21.18	15.80	74.59	W. Helget.
31	19.33	12.80	66.22	P. B. Cole.
31	18.89	13.85	73.05	J. H. McCracken.
Nov. 1	19.47	14.20	73.70	O. Coyle.
1	19.47	13.70	70.42	J. H. McCracken.
2	17.47	13.75	78.73	M. Best.
2	19.19	13.35	69.56	Do.
2	19.88	13.95	71.98	Do.
3	19.86	14.25	71.38	Osborn.
5	19.40	14.40	74.23	Rice.
6	20.07	14.45	72.00	A. W. Smith.
6	19.97	15.55	77.76	Do.
6	21.00	15.75	75.00	W. Schmidt.
6	20.17	14.75	73.12	S. B. Hunt.
6	18.78	13.55	72.15	T. Bennings.
7	20.02	14.55	72.67	Do.
7	21.74	16.15	74.29	Geo. Heydenrick.
8	18.97	13.65	73.01	E. Wennet, tops.
8	19.27	14.55	75.50	E. Wennet, roots.
8	17.43	13.05	75.55	A. L. Duncan.
8	19.81	16.20	81.79	Do.
9	22.37	17.95	80.63	O. Coyle.
9	21.20	17.10	80.66	Do.
9	20.83	16.70	80.19	Do.
9	16.97	12.55	73.98	Scott Cummings, Canema, Kansas.
10	20.23	16.20	80.19	Mawson.
10	18.57	13.55	72.97	P. B. Call.
10	19.03	15.50	81.60	O. Coyle.
11	19.90	16.05	80.69	Do.
12	19.53	14.60	74.87	J. H. McCracken.
12	21.13	17.50	82.94	O. Coyle.
12	17.77	13.40	75.90	M. Best.
12	20.63	16.00	77.76	F. F. Mullen; had been injured by web-worms; new tops have appeared.
12	18.07	15.00	83.30	Do.
12	20.00	15.80	79.00	A. L. Duncan.

Miscellaneous analyses of beets—Continued.

Date.	Solids.	Sucrose.	Purity.	Description of samples from—
	Per cent.	*Per cent.*		
Nov. 12	20.70	15 35	74.10	O. Coyle; non-alkali soil.
12	15.80	12.00	75.90	O. Coyle; alkali soil.
12	17.80	12.75	71.28	Do.
12	17.93	14.70	82.10	O. Coyle; non-alkali soil.
12	19.60	13.65	76.45	Hunt.
13	19.63	15.90	81.12	Smith.
13	21.20	17.10	80.66	Do.
13	18.93	14.00	71.09	Rice.
13	20.23	16.95	83.91	Schmidt.
13	19.77	16.17	81.73	Do.
13	16.69	12.55	74.00	K. Lammerman.
14	19.47	14.65	75.26	J. H. McCracken.
14	20.83	16.45	79.09	Mullen.
14	18.77	14.30	74.87	Hy. Hinze.
14	19.53	14.60	74.87	M. Best.
14	19.83	15.25	76.76	Geo. Heydenrick.
14	20.40	15.80	78.30	Do.
14	18.73	14.40	77.00	P. B. Cole.
14	19.67	14.60	74.30	Mullen.
14	20.80	16.15	77.64	A. W. Smith, roots.
14	19.80	15.40	77.80	A. W. Smith, tops.
16	21.20	16.75	79.01	George Mawson.
16	15.47	11.90	77.90	K. Lammerman.
16	17.77	13.20	74.60	T. Bennings, Wanzlebener.
16	18.53	13.80	74.60	T. Bennings, Vilmorin.
17	18.59	14.30	78.40	Rice.
17	19.87	16.00	80.80	J. B. Cool, roots.
17	18.77	14.55	77.50	J. B. Cool, tops.
17	21.20	17.10	80.66	J. D. Fleming.
17	20.83	16.40	78.44	Do.
17	21.27	18.45	87.02	O. Coyle, non-alkali.
17	18.89	14.45	76.60	O. Coyle, alkali.
17	20.93	16.50	79.00	Beet pile.
17	15.10	11.70	78.75	K. Lammerman.
17	17.07	15.35	78.25	Beet pile, roots.
17	19.00	14.70	78.30	Beet pile, tops to above.
17	17.54	13.75	78.73	K. Lammerman.
17	18.03	14.10	78.35	Underwood.
18	17.47	13.75	78.75	Horn.
18	15.65	11.95	76.25	Beet pile, one yellow beet.
18	17.40	13.65	78.25	Beet pile, one very large beet, weight 7¼ lbs.
18	16.93	12.55	73.95	Rice.
18	18.77	15.40	82.40	A. W. Smith.
18	19.50	16.00	82.01	Do.
18	19.60	15.90	81.04	W. Schmidt.
18	17.82	13.65	76.45	Hy. Hinze.
18	18.27	13.50	74.18	A. R. Moore.
18	20.84	15.30	73.40	Do.
18	21.84	15.90	72.81	Blackford.
19	19.86	14.25	71.38	Osborn.
19	20.03	15.00	74.88	Beet pile, well shaped beets.
19	20.23	15.40	76.62	Beet pile, well shaped beets.
19	20.37	15.35	74.72	Beet pile, well shaped beets.
19	17.07	13.35	78.35	Beet pile, imperfect beets.
19	20.71	15.35	74.01	O. Coyle.
19	19.10	15.90	83.20	Do.
19	19.10	14.70	76.20	A. R. Moore.
19	19.77	15.60	49.20	J. D. Fleming.
19	18.21	15.90	86.90	Do.
19	21.73	17.25	80.00	W. Helget.
20	20.27	15.90	79.20	Beet pile, selected.
20	19.70	15.65	79.20	Beet pile, selected.
20	20.83	16.70	83.29	Geo. Heydenrick, selected.
20	21.77	17.65	81.33	A. W. Smith, selected.
21	17.80	12.75	71.28	Attica, Harper County, Kans.
21	17.36	11.25	68.40	Do.
21	21.33	16.70	78.40	O. Coyle, non-alkali soil.
21	19.23	14.40	75.00	O. Coyle, alkali soil.
21	17.77	13.90	78.53	Rice.
21	16.67	12.55	74.10	M. Best.
21	18.77	14.55	77.50	S. B. Hunt.
22	19.63	15.90	81.12	E. Wennet.
22	18.33	14.05	77.03	Do.
22	18.59	13.55	72.97	Hy. Hinze.
22	18.73	13.65	72.73	M. H. Sparks.
22	20.23	16.20	80.19	A. L. Duncan.
22	18.93	14.00	74.09	J. H. McCracken.
22	19.47	14.10	72.70	Do.
22	19.77	15.60	79.20	L. Clovis.

Miscellaneous analyses of beets—Continued.

Date.	Solids.	Sucrose.	Purity.	Description of samples from—
	Per cent.	*Per cent.*		
Nov. 22	20.93	16.50	79.00	Do.
22	18.89	14.45	76.60	Dobbs Bros.
22	21.27	18.45	87.02	A. W. Smith.
22	20.83	16.40	78.84	J. D. Fleming.
22	21.20	17.10	80.66	O. Coyle, non-alkali.
22	17.77	13.85	78.00	G. H. Moore.
22	18.07	14.10	78.35	Underwood.
22	18.33	14.60	79.80	Beet pile.
22	20.60	16.65	80.82	Do.
22	19.13	15.00	78.50	Do.
22	17.73	13.45	73.44	Do.
22	20.29	15.60	76.85	J. B. Cool.
22	18.70	13.80	73.79	Do.
22	22.00	16.80	76.36	Do.
22	19.00	14.90	78.40	Geo. Heydenrick.
22	18.27	13.50	74.18	T. Benning, large beets.
22	17.82	13.65	76.45	Do. do.
22	19.60	15.90	81.04	A. R. Moore, large beets.
22	19.50	16.00	82.01	A. R. Moore, small beets.
22	18.77	15.40	82.40	Mullen.
22	16.93	12.55	73.95	Mullen, very large beets.
23	17.40	13.65	78.25	Load, roots.
23	15.63	11.95	76.25	Load, top of root.
23	19.47	14.65	75.26	Do.
23	20.83	16.25	79.09	Load, root.
23	19.83	15.45	76.76	Do.
23	19.53	14.60	74.87	Load top of root.
23	18.77	14.30	76.45	Beet pile, large yellow beet.
24	20.93	16.40	78.00	O. Coyle, non-alkali soil.
24	19.70	15.65	79.20	O. Coyle, alkali soil.
24	20.40	15.80	78.30	J. D. Fleming.
24	20.30	15.00	78.70	Do.
24	19.00	14.25	75.25	Blackford.
24	20.80	16.15	77.64	E. Wennet.
24	21.77	17.65	81.33	W. Helget.
24	19.67	14.60	74.50	A. W. Smith.
24	20.17	15.55	77.60	A. R. Moore.
24	19.57	14.83	76.38	Mullen, roots.
24	18.23	14.00	76.90	Mullen, top of root.
24	19.33	14.80	76.70	J. H. McCracken.
25	20.83	16.70	80.29	Mr. Hinman, taken from pile.
25	18.70	14.05	74.88	Osborn.
25	21.70	17.40	81.31	W. Schmidt, high, red ground.
25	18.63	13.40	73.80	W. Schmidt, low, dark ground.
25	21.43	16.80	78.62	Hartzell, dark loam.
25	18.33	14.60	79.80	Selected samples, beet pile, roots.
25	17.77	13.45	73.44	Selected samples, beet pile, tops.
25	22.00	16.80	76.36	Selected samples, beet pile, roots.
25	20.29	15.60	76.85	Selected samples, beet pile, tops.
25	17.40	13.65	78.25	Selected samples, beet pile, roots.
25	15.63	11.95	76.25	Selected samples, beet pile, tops.
25	18.51	14.45	77.80	Selected samples, beet pile, roots.
25	17.69	13.25	71.26	Selected samples, beet pile, tops.
25	17.77	13.80	78.00	Selected samples, beet pile, roots.
25	15.88	12.00	78.00	Selected samples, beet pile, tops.
25	19.27	16.20	84.07	Selected samples, beet pile, roots.
25	20.70	15.35	74.01	Selected samples, beet pile, tops.
25	18.13	13.65	74.20	One large beet, A. W. Smith, weight 2 pounds 10 ounces.
26	17.80	12.75	71.28	Red and pink beets, pile.
26	20.93	17.35	82.81	Selected samples, pile, average weight 9 ounces.
26	19.63	15.90	81.12	Selected samples, pile, average weight 13 ounces.
26	19.77	15.60	79.20	Transplanted beets, Coyle.
26	21.17	16.70	79.14	Selected samples, load of Coyle.
26	21.57	17.25	80.23	Do.
26	18.83	16.15	85.90	Do.
26	21.23	18.35	86.93	Do.
26	22.22	16.10	72.49	Do.
26	21.12	13.50	63.91	Yellow beets, pile.
26	20.87	15.20	72.83	Mawson.
26	19.13	14.70	76.95	McCracken.
26	10.03	5.60	55.83	White table beet.
26	19.70	15.65	79.20	Pile, root.
26	18.73	14.40	77.00	Pile, top.
26	21.13	17.50	82.94	Pile, root.
26	20.40	16.35	80.14	Pile, top.
26	17.77	13.80	78.00	Pile, root.

Miscellaneous analyses of beets—Continued.

Date.	Solids.	Sucrose.	Purity.	Description of samples from—
	Per cent.	*Per cent.*		
Nov. 26	17.10	12.87	74.90	Pile, top.
26	19.73	16.10	81.63	Pile, root.
26	18.77	15.40	82.01	Pile, top.
26	20.23	17.00	84.20	Very perfect beets, pile.
26	20.65	16.85	81.77	Do.
26	21.33	17.00	79.40	Do.
27	22.00	16.05	72.95	Load, root.
27	19.51	14.60	74.87	Load, top.
27	19.47	14.10	72.70	Do.
27	21.80	16.05	73.62	Load, root.
27	18.89	14.45	76.60	Load, top.
27	18.97	15.03	79.40	Load, root.
27	18.57	14.50	78.40	Load, top.
27	19.90	15.70	79.30	Load, root.
27	17.77	13.20	74.60	Jackson.
28	22.76	18.50	81.50	Load, root.
28	21.63	17.45	80.60	Load, top.
28	19.81	16.20	81.79	Load, root.
28	19.70	15.65	79.73	Load, top.
28	18.03	15.00	83.30	Load, root.
28	18.20	14.15	77.98	Load, top.
28	18.03	15.00	83.30	Load, tops of root.
28	18.37	14.60	79.81	Load, roots.
28	21.07	18.40	87.62	Load, tops of root.
28	21.77	17.25	79.32	Load, roots.
29	20.03	15.80	78.88	Carload of beets from Newton, Kans.
29	13.63	8.10	59.69	Do.
29	19.69	16.70	83.40	Do.
29	20.30	16.20	79.89	Do.
29	20.40	15.70	77.09	Do.
29	18.40	14.20	76.83	Do.
29	18.88	14.00	74.03	Do.
29	18.30	15.50	84.70	Load, tops of root.
29	18.40	13.95	75.55	Load, roots,
29	22.37	18.40	82.51	Load, tops of root.
29	21.03	16.35	77.87	Load, roots.
29	21.60	18.30	84.72	Load, tops of root.
29	21.23	16.10	75.94	Load, roots.
30	20.13	16.40	81.60	Beet pile.
30	20.80	16.80	80.83	Do.
30	19.28	15.35	78.63	Do.
30	20.43	17.00	83.33	Do.
30	19.27	15.20	79.21	Do.
30	20.70	16.70	80.67	Do.
30	20.57	16.75	81.43	Do.
30	18.20	14.30	78.61	Do.
30	21.48	16.90	78.94	Do.
30	20.20	17.10	84.60	Do.
Dec. 1	13.70	8.60	62.77	Carload of beets from Newton, Kans.
1	15.03	9.80	65.33	Do.
1	15.03	10.60	70.66	Do.
1	15.47	10.60	68.83	Do.
1	15.60	9.20	59.00	Do.
1	16.43	12.40	75.60	Do.
1	13.47	8.60	64.19	Do.
1	14.35	10.00	69.09	Do.
1	16.10	11.60	72.05	Do.
1	15.57	10.80	69.23	Do.
1	18.77	13.65	72.73	Beet pile, root.
1	17.49	12.37	71.26	Beet pile, top of root.
1	19.37	15.40	80.30	Beet pile, root.
1	18.80	14.40	77.10	Beet pile, top of root.
2	20.83	16.73	80.32	Beet pile, root.
2	18.73	14.05	74.87	Beet pile, top of root.
2	19.90	15.05	78.31	Beet pile, root.
2	18.30	14.25	78.09	Beet pile, top of root.
2	19.73	15.60	79.11	Beet pile, root.
2	18.73	14.45	77.03	Beet pile, top of root.
4	23.07	19.30	83.91	Hartzell. Purchased by Department of Agriculture for seed.
5	23.00	18.65	81.52	Do.
5	25.27	20.79	83.79	Do.
6	23.40	19.45	82.70	Do.
6	22.37	17.95	80.58	Do.
6	25.83	21.80	80.62	Do.
Mean	18.92	15.19	79.83	
Maximum	25.83	21.80	86.90	
Minimum	11.27	5.60	54.11	

Load tests.

[In the juice.]

Date.	Solids.	Sucrose.	Purity.	Date.	Solids.	Sucrose.	Purity.
	Per cent.	*Per cent.*			*Per cent.*	*Per cent.*	
Nov. 14	17.77	13.85	78.00	Nov. 19	15.83	11.60	73.40
15	18.07	14.10	78.35	19	15.47	12.40	80.50
17	18.33	14.60	79.80	19	17.80	13.40	75.30
17	20.60	16.65	.80.82	19	17.80	13.45	75.35
17	19.13	15.00	78.50	19	20.63	16.00	77.76
17	17.73	13.45	73.44	19	19.67	15.00	76.53
17	20.29	15.60	76.85	19	19.51	14.60	74.84
17	18.70	13.80	73.79	19	19.71	15.37	77.40
17	22.00	16.80	76.36	19	17.38	12.40	71.68
17	19.00	14.90	78.40	19	18.29	14.00	76.90
17	18.27	13.50	74.18	19	16.73	12.25	73.65
17	17.82	13.65	76.45	19	19.63	15.20	77.60
17	19.00	15.90	81.04	19	19.63	15.00	76.53
17	19.50	16.00	82.01	19	20.33	16.65	81.89
17	18.77	15.40	82.40	19	17.50	13.00	74.30
17	16.93	12.55	73.95	19	17.40	12.75	73.99
17	17.40	13.65	78.25	19	17.77	13.40	75.70
17	15.63	11.95	76.25	19	18.17	13.65	75.10
17	19.73	16.10	81.63	19	16.93	12.05	71.31
17	16.60	13.05	78.30	19	15.03	11.25	74.70
17	17.93	14.70	82.10	20	18.30	14.15	77.05
18	18.21	15.70	86.25	20	19.77	14.90	75.66
18	19.30	15.60	80.80	20	21.03	16.15	76.79
18	20.93	17.35	82.89	20	18.77	14.05	74.98
18	20.39	16.25	79.69	20	18.51	14.35	77.30
18	19.90	16.15	81.15	20	19.11	15.00	78.50
18	19.38	16.90	87.20	20	19.00	14.50	76.30
18	19.10	14.70	76.95	20	20.27	16.20	79.92
18	21.50	16.40	76.28	20	17.03	12.35	72.35
18	17.69	13.30	75.55	20	18.27	13.60	74.73
18	18.21	14.75	80.80	20	17.80	12.70	71.28
18	17.77	14.30	88.18	20	17.50	14.20	81.10
18	17.80	12.75	71.28	20	17.80	12.85	71.91
18	17.10	12.87	74.90	20	17.79	13.25	74.60
18	19.63	16.00	81.51	20	19.13	14.60	76.40
18	19.10	15.90	83.20	20	16.53	13.35	80.60
18	17.69	13.25	71.26	20	20.37	15.60	76.95
18	18.51	14.45	77.88	20	19.17	15.10	79.05
18	19.97	16.00	80.12	20	17.67	13.40	76.10
18	15.80	12.00	75.90	20	19.63	15.25	77.60
18	17.77	13.80	78.00	20	19.93	15.00	75.50
18	18.33	14.60	79.80	20	19.77	15.10	76.44
18	18.33	14.20	77.60	20	18.80	14.35	76.05
18	18.57	14.55	78.40	20	16.00	12.15	75.65
18	20.70	15.35	74.01	20	20.40	16.15	79.16
18	18.63	14.20	76.30	20	19.73	15.25	77.20
18	19.27	16.20	84.07	20	18.37	14.60	79.80
18	17.77	14.70	83.00	20	17.53	13.00	74.85
19	20.00	15.60	78.00	20	20.37	15.35	76.12
19	18.03	14.10	78.35	20	20.17	16.00	79.32
19	17.47	13.75	78.73	20	19.03	14.50	76.30
19	17.54	13.60	78.70	20	17.71	14.95	84.20
19	19.00	14.70	78.30	20	19.27	15.35	79.20
19	17.07	13.35	78.25	20	18.00	14.10	78.90
19	15.10	11.70	78.75	20	17.39	12.50	72.83
19	18.27	14.80	81.30	20	17.78	14.30	81.40
19	20.17	15.20	75.62	20	16.41	12.10	73.75
19	16.00	11.90	74.35	20	19.47	14.20	73.70
19	16.00	11.80	73.80	20	18.60	14.20	76.30
19	16.53	12.15	73.35	20	18.40	13.05	75.55
19	18.33	14.20	77.60	20	19.10	14.55	76.40
19	17.53	13.20	75.42	20	18.27	14.50	79.70
19	17.57	13.20	75.40	20	18.43	13.75	75.00
19	18.20	14.70	80.80	20	18.83	14.00	74.48
19	19.37	15.30	79.30	20	16.30	12.40	76.10
19	19.60	15.70	80.60	21	17.27	13.95	81.40
19	18.70	15.10	80.70	21	19.81	16.20	81.79
19	18.30	13.70	85.80	21	20.33	15.90	79.31
19	13.37	14.95	81.46	21	18.80	14.40	77.10
19	17.53	13.35	75.00	21	19.37	15.40	80.30
19	17.40	13.40	77.00	21	20.33	16.40	80.67
19	19.11	14.60	76.42	21	21.00	16.35	77.86
19	18.74	14.10	75.60	21	20.40	15.70	79.80
19	18.03	15.00	83.30	21	18.80	14.95	77.80
19	18.43	14.00	76.20	21	16.80	12.90	77.40
19	17.00	13.00	76.50	21	18.40	15.10	81.30
19	16.93	12.50	73.95	21	20.37	15.40	75.87

Load tests—Continued.

[In the juice.]

Date.	Solids.	Sucrose.	Purity.
	Per cent.	*Per cent.*	
Nov. 21	21.23	16.10	75.94
21	17.47	12.37	71.26
21	18.77	13.65	72.73
21	19.87	15.80	80.30
21	17.43	13.05	75.25
21	19.27	15.10	78.65
21	17.20	14.75	85.45
21	21.80	17.15	78.67
21	18.90	14.00	75.16
21	19.30	14.80	76.70
21	20.00	14.80	74.00
21	19.00	13.70	72.66
21	19.00	14.25	75.25
21	20.80	16.15	77.64
21	21.77	17.65	81.33
21	19.67	14.60	74.50
21	20.17	15.55	77.60
21	19.57	14.85	76.38
21	18.23	14.00	76.90
21	19.33	14.80	76.70
21	20.83	16.70	80.29
21	18.70	14.05	74.88
21	20.00	15.90	79.50
21	20.00	15.45	77.25
21	18.63	14.00	75.27
21	19.03	15.85	83.20
21	18.23	13.75	75.80
21	19.91	14.90	75.20
21	19.49	14.60	74.87
21	19.59	14.60	75.26
21	18.29	14.20	78.00
21	19.89	15.05	78.30
21	21.39	16.25	76.29
21	18.19	14.10	77.90
21	16.63	14.30	86.15
22	20.43	15.50	75.92
22	18.77	14.30	76.45
22	19.03	14.20	74.79
22	21.63	17.40	80.55
22	20.33	15.60	76.85
22	20.33	15.70	77.32
22	20.47	15.25	74.50
22	19.47	14.65	75.26
22	20.83	16.45	79.09
22	19.83	15.25	76.76
22	19.53	14.60	74.87
22	18.77	14.30	76.45
22	20.93	16.40	78.00
22	19.70	15.65	79.20
22	20.40	15.80	78.30
22	20.30	15.00	78.70
22	18.73	14.40	77.00
22	19.90	15.25	76.38
22	19.30	15.90	82.90
22	20.27	15.90	79.20
22	19.70	15.35	77.70
22	21.60	17.20	80.00
22	21.40	17.50	81.77
22	20.90	16.75	80.14
22	10.67	15.60	79.60
22	21.13	17.50	82.94
22	21.13	17.50	82.94
22	19.73	15.00	76.14
23	21.73	17.25	80.00
23	20.40	16.35	80.14
23	21.40	17.40	81.31
24	19.43	16.05	82.22
24	21.17	16.70	79.14
24	19.80	15.45	77.80
24	20.43	15.95	78.18
24	16.37	12.95	79.80
24	20.20	15.75	78.20
24	19.83	15.45	77.80
24	19.17	14.50	75.91
Nov. 24	20.47	15.25	74.50
24	21.57	17.25	80.23
24	19.63	14.93	76.02
24	19.57	15.20	77.90
24	19.80	15.40	77.80
24	21.20	16.75	79.01
24	19.90	16.05	80.69
24	19.60	16.05	82.00
24	16.40	11.90	73.20
24	15.47	11.90	77.90
24	19.90	15.35	76.88
24	17.77	13.20	74.60
24	18.17	14.15	77.90
24	19.77	16.17	81.73
24	19.57	15.55	79.50
24	19.67	15.40	78.60
24	19.03	15.50	81.60
24	19.93	15.20	76.38
24	18.53	13.80	74.60
24	20.13	16.10	80.19
24	18.83	16.15	85.90
24	19.87	16.00	80.80
24	18.57	14.50	78.40
24	19.87	16.00	80.80
24	20.50	16.15	78.53
24	19.63	15.40	78.60
24	18.70	14.65	78.10
24	19.70	15.40	78.20
24	18.13	14.45	79.60
24	20.23	16.95	83.91
24	21.33	16.70	78.40
24	19.23	14.40	75.00
24	17.77	13.90	78.55
24	16.67	12.55	74.10
24	18.77	14.55	77.50
24	19.63	15.90	81.12
24	18.33	14.05	77.03
24	18.57	13.55	72.99
24	18.73	13.65	72.73
24	20.23	16.20	80.19
24	18.93	14.00	74.09
24	19.47	14.10	72.70
24	19.77	15.60	79.20
24	20.93	16.50	79.00
24	18.89	14.45	76.60
24	21.27	18.45	87.02
24	20.83	16.40	78.84
24	21.20	17.10	80.66
26	20.73	16.60	80.00
26	21.03	18.00	85.71
27	17.83	13.40	75.30
27	21.37	17.90	84.03
27	20.10	16.65	82.83
27	19.00	15.30	81.00
27	22.00	16.05	72.95
27	21.80	16.05	73.62
27	18.97	15.05	79.40
27	19.90	15.70	79.30
28	20.00	15.80	79.00
28	22.76	18.50	81.50
28	19.51	16.20	81.79
28	18.03	15.00	83.30
28	21.07	18.40	87.62
28	24.37	19.50	80.25
29	18.30	15.50	84.70
29	22.37	18.40	82.51
29	22.37	18.40	82.51
29	21.60	18.30	84.72
Dec. 1	18.73	15.50	82.90
Mean	18.52	15.12	81.04
Maxims	24.37	19.50	88.18
Minims	15.10	11.60	71.26

Composition of ash of beets grown at Medicine Lodge, Kansas.

DESCRIPTION OF SAMPLES.

No. of sample.	Description.	Grown by—	Kind of soil.
8432	Necks of beets Roots	Mr. Fleming	Upland red soil.
8433	Necks of beets Roots	O. Coyle	Bottom alkali soil.
8434	Necks of beets Roots Leaves	A. W. Smith	Bottom land; not alkaline.

Table of analyses of ash of beets and beet leaves, grown at Medicine Lodge, Kansas.

ASH, SOLUBLE IN BOILING WATER.

	Necks of 8432.	Roots of 8432.	Necks of 8433.	Roots of 8433.	Necks of 8434.	Roots of 8434.	Leaves of 8434.
CO_2	15.50	19.90	22.44	29.04	17.50	27.17	14.34
Cl	17.39	16.37	4.53	2.88	14.25	11.78	17.36
SO_3	7.76	2.66	10.17	5.02	10.49	1.97	12.72
P_2O_5	1.73	2.74	2.57	0.87	3.03	5.70	0.42
K_2O	46.95	45.79	57.52	61.90	51.10	50.30	41.33
Na_2O	11.57	13.22	2.87	2.45	6.92	3.05	18.65
SiO_2	0.88	0.30	0.50	0.30	0.20	0.20	0.35
CaO	Trace.	Trace.	Trace.	Trace.	Trace.	Trace.	0.53
Total	101.78	100.98	100.60	102.46	103.49	100.13	105.70
Corrected for Cl	97.86	97.29	99.58	101.59	100.28	97.48	101.77

ASH, INSOLUBLE IN BOILING WATER.

	Necks of 8432.	Roots of 8432.	Necks of 8433.	Roots of 8433.	Necks of 8434.	Roots of 8434.	Leaves of 8434.
CO_2	4.07	6.36	8.28	7.99	6.95	3.95	3.37
SiO_2	36.74	19.21	23.56	12.49	35.96	9.31	55.86
Mn_3O_4	1.21	1.31	0.74	1.54	0.74	1.10	0.41
CaO	12.76	13.82	23.24	23.11	11.02	14.82	12.36
P_2O_5	7.66	10.74	14.48	16.03	16.81	20.10	6.59
MgO	22.58	38.27	21.44	37.53	15.51	38.28	15.01
Fe_2O_3	6.70	4.88	4.73	0.76	5.80	4.60	3.40
K_2O	5.60	3.30	2.07	1.22	3.05	4.35	3.20
Na_2O	2.54	1.50	1.04	0.33	2.25	1.63	1.95
Total	99.86	99.39	99.58	101.00	98.09	98.14	102.15

TOTAL, SOLUBLE AND INSOLUBLE ASH COMBINED,

	Necks of 8432.	Roots of 8432.	Necks of 8433.	Roots of 8433.	Necks of 8434.	Roots of 8434.	Leaves of 8434.
CO_2	12.07	17.19	16.33	23.67	14.07	21.32	9.35
Cl	12.17	13.05	2.90	2.15	9.60	9.26	9.41
SO_3	5.43	2.12	6.74	3.74	7.05	1.55	6.89
P_2O_5	3.51	4.36	6.58	4.74	7.52	8.78	3.31
K_2O	34.55	37.17	40.21	46.43	35.43	43.97	10.11
Na_2O	8.86	10.84	2.25	1.91	5.39	2.95	22.40
SiO_2	11.64	4.14	8.27	3.48	12.85	2.05	26.14
Mn_3O_4	0.36	0.27	0.25	0.39	0.24	0.24	0.14
CaO	3.83	2.81	7.83	5.89	3.59	3.15	6.03
MgO	6.77	7.77	7.23	9.57	5.48	8.19	7.02
Fe_2O_3	2.01	0.99	1.59	0.19	0.99	0.98	3.18
Total	101.20	100.71	100.18	102.16	102.21	102.44	103.98
Corrected for Cl	98.46	97.77	99.53	101.67	100.04	100.35	101.62

EFFECT OF SOIL ON BEET PRODUCTION.

Not only the climate but also the soil affects profoundly the quality of the beets grown. This is well illustrated by the experiment of Briem, published in Austro-Hungarian Journal of the Sugar-Beet Industry and of Agriculture, vol. 17, p. 571.

Briem chose two typical soils for a comparative trial, near each other, in order to secure identical climatic conditions. The mother beet from which the seeds were obtained was a Vilmorin improved, which contained 19.86 per cent sugar. The seeds were planted in the two soils under precisely similar conditions and received the same culture. The one soil was very poor, with a gravelly subsoil. The other was a rich garden soil, on which a pond had once stood.

The beets which were produced were so different that even an expert would not have admitted that they came from the same seed. The poor soil gave a small beet, which soon reached the term of its vegetation, while the rich soil furnished a beet resembling those raised for forage and which at the time of harvest was still in full vegetation. A tabular view of the results is instructive:

Description.	Weight of root.	Sugar.
	Grams.	*Per cent.*
Mother beet	298	19.86
Beet from poor soil	160	14.57
Beet from rich soil	876	13.61

That a race of beets introduced into a new country develops new characteristics has long been known, but the above shows in a striking manner the part that the soil itself may take in these transformations.

CULTURE OF THE KLEIN WANZLEBENER ORIGINAL.

In a letter from the proprietors of the sugar factory at Klein Wanzleben, some interesting data have been communicated concerning the original Klein Wanzlebener beet, from which all the different varieties of this family have been derived. The methods of selection of beets for seed production are described as follows:

> For the production of our beet seed, which is carried on by us exclusively, we use none but the full-grown beets, having never been able to satisfy ourselves with regard to the use of small beets. Although this method of cultivation would be much more profitable it has always appeared to us to be contrary to all laws of nature, and the seed from such imperfect beets is certainly more subject to degeneration than that from full-grown, mature beets. Variations of form can never be safely detected in these dwarf beets, while the mature beets are chosen with the greatest certainty by their external appearance.
>
> The selection of the mother beets on the field and before siloing is made with the greatest care. Only those fields are used for this purpose which have been planted with seed from beets which were polarized and whose actual sugar content has been determined by the alcohol-extraction method. All beets which are defective in growth are rejected.
>
> The process of selection commences in November, after all the beets have been harvested, and continues until the middle of April.
>
> The work is carried on in three laboratories. In Laboratory I the beets are assorted by means of a solution of salt. About nine-tenths of all the beets reserved for seed selection are rejected in this laboratory, and only about 100,000 beets are transferred to Laboratory II.

The per cent of sucrose in the juice of these beets is now determined in Laboratory II by the polariscope, the figure thus obtained being always considerably reduced so as to allow for variations. The actual sucrose content of these polarized beets—daily about 150–200—is determined in Laboratory III by the alcohol method, so as to have a check on the polarization, and to avoid errors which might be caused by the presence of optically active bodies. Only those beets whose high sugar content is definitely proved by the last method are chosen for cultivation. These are again assorted, the finest specimens being planted in the spring for the production of extra fine seed. This seed, of which we can only furnish limited quantities, is therefore obtained from high polarizing beets without an intervening generation. We do not, however, consider that the careful selection of mother beets by their sugar content insures satisfactory results. If the choice of mother beets by polarization were the only condition necessary to obtain good results, every large estate would be able within a few years to raise a beet satisfactory in all respects. This is, however, impossible, as the beet is, more than any other plant, subject to sudden degeneration, which is explained partly by the history of its development and partly by insufficient transmitting of those qualities which distinguished the mother beet.

Very often external conditions, such as location and fertilization, exercise at times a deteriorating influence and cause a poor quality of beet, such as is not a natural variation of the family and is not hereditary.

For these reasons it is absolutely necessary, if we wish to raise a beet of constant high quality, to observe the experimental crops for a number of years, both as to their external appearance and chemical properties.

The fact that the beet is a biennial plant renders this method of selection proportionally more difficult.

The cultivation by families, together with the most conscientious individual cultivation, has been the foundation of our work for more than 30 years. It insures certain success to the growers of our original beet, an individual superior both in quality and quantity; in short, results such as the varieties introduced in Germany during the last ten years are unable to guaranty as the proof of their constant high quality, which can only be determined by careful observations extended over many years, is wanting.

As a transfer of the beet into other conditions of climate and soil may cause a deterioration in the second generation, the statement that the seed was obtained from our finest quality of beet is not a certain guaranty of success.

Some interesting data in regard to the operation of the sugar factory are also communicated, this being one of the companies which carries on both the manufacture of sugar and the production of sugar-beet seed. As will be seen from the data communicated the object is to produce not only a rich beet but one of large size, so as to secure as large a yield as possible of sugar per acre.

The data in regard to the operations of this factory follow:

[Sugar Factory Klein Wanzleben, successors to Rabbethge & Giesecke Stock Company at Klein Wanzleben.]

We beg permission to send the following data for general information concerning our house:

Our capital is 2,700,000 marks. Our stockholders are under no obligations to raise or furnish beets.

Our plant consists of a raw-sugar factory, which diffuses about 7,000 hundred-weight beets per day, and a molasses desucration factory, which is capable of working up about 1,000 hundred-weight of molasses. A large farming estate is connected with the factory. The beet-sugar factory diffuses during the campaign about 500,000 hundred-weight beets. The yield in the campaign of 1890 was:

	Per cent.
First product	11.32
Second product about	1.40
Third product about	.20
Total	12.92

Our estate consists (excluding a large area which is planted with wheat, oats, etc.) of about 5,000 morgen of beets, both purchased beets and seed beets (4 morgen = 1 hectare; 1 English acre = about 1¼ morgen).

The yield of 1889 was reduced by the poor results on certain strips of land, but nevertheless the average yield was 207.4 hundred-weight per morgen, some strips yielding as high as 284 hundred-weight. The crop of 1890 will yield about 200 hundred-weight per morgen.

A very important branch of our farm is the improvement of beet seed, which we have engaged in for the last thirty years.

The mother beets are chosen from the plats by careful methods of selection. In 1889–'90 we examined 2,782,300 beets, of which 3,043, that is, about one per thousand, were chosen for purposes of cultivation. The extensive work of selection occupies our experts from January to April, and visitors to our laboratories are always welcome. We are always pleased to give all information desired.

Our united farming and manufacturing interests soon proved to us the necessity of cultivating beets according to the yield of sugar per morgen, and we found the cultivation of our original Klein Wanzlebener beet, which unites a high yield per morgen with a high sugar content, as most profitable.

We desire to point out that we have adopted the name *Original* Klein Wanzlebener beet seed, as varieties of this beet have appeared of late which are offered under such names as "improved, containing a high percentage of sugar," etc., and which, in many cases, are not equal to the Klein Wanzlebener beet. The above name also provides a means of distinguishing between our original beet and these varieties.

We will be glad to furnish directions for the introduction of the beet, its cultivation, the methods of planting our Original Klein Wanzlebener beet, and samples of the seed.

KLEIN WANZLEBEN, *February*, 1890.

SYSTEMATIC STUDY OF THE DIFFERENT VARIETIES OF SUGAR BEETS IN SAXONY.

Professor Maercker of Halle has, for several years, collated the data in regard to the different varieties of sugar beets grown in Saxony; arranged in respect of their improvement in sugar percentage and in yield of sugar per acre. Nine reports have already been issued on this subject, containing data on all the different varieties of sugar beets grown in Saxony and especially on the different branches of the Vilmorin and Klein-Wanzlebener families of beets.

From Professor Maercker's ninth report the following table has been compiled, showing the character of some of the different varieties of beets investigated:

Comparative mean results of Professor Maerker's experiments in 1888.

	Sugar in the beet.	Sugar in the juice.	Purity quotient.	Yield of beets per acre.	Yield of sugar per acre.	No. of beets per acre.
Sugar beets of Vilmorin origin:	*Per ct.*	*Per ct.*		*Pounds.*	*Pounds.*	
Gebr. Dippe's zuckerreichste Élite	15.96	18.15	87.70	25,942	4,141	34,773
Heine-Emersleben verbesserte Vilmorin	15.70	17.81	87.70	27,702	4,349	33,894
Schreiber & Sohn Original	15.49	17.87	87.10	26,752	4,145	34,461
Knoche-Wallwitz, Vilmorin	15.48	17.90	88.23	29,128	4,509	34,677
Mette Vilmorin	15.37	17.67	87.80	27,262	4,189	35,254
Strandes Vilmorin	15.22	17.37	87.30	25,274	3,846	34,738
Schlitte-Aumühle Vilmorin	15.04	17.20	87.40	27,262	4,101	34,253
Grasshoff-Quedlinburg Vilmorin	14.82	17.05	88.40	28,019	4,154	34,462
Means	15.39	17.63	87.71	27,174	4,180	34,566
Sugar beets of Klein-Wanzlebener origin:						
Gebr. Dippe's verbesserte Klein-Wanzlebener Élite	15.55	17.89	88.75	31,698	4,928	34,909
Knoche-Wallwitz Klein-Wanzlebener	15.53	17.48	87.30	31,064	4,822	36,154
Kortum-Sondershausen Klein-Wanzlebener	15.44	17.61	88.20	28,670	4,428	34,525
Klein-Wanzlebener Original	15.38	17.44	88.73	32,965	5,071	35,163
Heine-Emersleben Klein-Wanzlebener	15.36	17.56	88.70	32,102	4,933	35,048
Neu-Querfurter Rübe	15.21	17.24	88.80	31,768	4,831	36,059
Grasshoff-Quedlinburg Klein-Wanzlebener	14.91	16.71	88.30	29,374	4,379	34,266
Braune-Biendorf Klien-Wanzlebener	14.85	17.01	88.10	32,894	4,884	35,446
Schreiber & Sohn Klein-Wanzlebener	14.71	16.62	87.80	33,686	4,956	37,200
Rimpau-Schlanstedt Klein-Wanzlebener	14.69	16.75	87.60	33,950	4,988	35,222
Wilke-Gr.-Möhringen Klein-Wanzlebener	14.56	16.67	88.20	33,422	4,866	35,170
Ziemann-Quedlinburg Klein-Wanzlebener	14.43	16.44	87.80	34,109	4,475	36,133
Strandes-Zehringen Klein-Wanzlebener	14.40	16.64	87.40	33,810	4,870	35,971
Means	15.00	17.08	88.13	32,278	4,836	35,482
Sugar beets of other strains:						
Bestehorn-Belitz Dividenden	15.15	17.88	87.70	28,670	4,344	34,936
Mette Specialität	14.78	16.60	87.70	32,877	4,859	34,955
Braune-Biendorf Kreuzung	14.71	16.90	88.04	33,264	4,893	34,912
Schlieckman-Auleben Specialität	14.38	16.35	87.80	33,352	4,796	34,349
Means	14.76	16.93	87.81	32,050	4,724	34,787

GENERAL CONCLUSION.

The result of the analyses at Grand Island and other places show that beets of high sugar content and great purity can be grown in many parts of the United States. The average size of the beets, however, in many places is too small to assume that their culture would prove profitable. It would be far better for all interests to grow beets averaging from 600 to 700 grammes in weight, even if the percentage of sugar should drop one or two points. The causes of the small crop at Grand Island have already been set forth, and it is not necessary to repeat them here. The Department has organized an experimental station for the culture of the sugar beet at Schuyler, Nebraska, and it is confidently expected that rich beets with high tonnage can be produced.

In a critical study of the data given above there are many points of interest. In judging of the character of a beet for sugar-making purposes three factors must be taken into consideration. First of all, the beet must be large enough to make its growth profitable to the farmer. Experience has shown that a beet which weighs about 600 grammes, that is a little over 1 pound, is best suited to secure the interests of both the farmer and the manufacturer. Therefore, in all cases attempts should be made to grow beets as uniformly as possible of that weight. Having once established the average weight of the beet, the next point to be considered is its content in sugar. In the data given the percentage of sugar is reckoned on the weight of the beet itself and not upon the extracted juice. Sugar beets contain on an average about 5 per cent of marc and 95 per cent of juice. Therefore if the analysis is made upon extracted juice, the number obtained must be multiplied by 0.95 to give the percentage of sugar in the beet.

The question may arise as to how poor a beet can be in sugar and still be profitable for sugar making. This of course is a question which has to be determined by a comparison with many economic problems, the study of which can not be introduced at the present time. In general, however, it may be said that the limit of profit in manufacture will be reached when the percentage of sugar in the beet drops to 12, although it is possible under certain conditions for factories to work economically and profitably on beets having a lower percentage of sugar than that indicated.

With the present degree of perfection in the production of rich sugar-beet seed, and with the knowledge of the scientific principles of agriculture which should guide the beet-grower, it is possible, I think, to show that beets can be produced, under favorable soil and climatic conditions, which will contain on an average 14 per cent of sugar. The farmer, therefore, should not be satisfied if his results fall below this standard.

It will be easy to see, by comparing the averages given in the above tables, how many of the beet-growers have succeeded in growing plants which will average 600 grammes in weight and contain 14 per cent of sugar.

In addition to these two factors, however, a third must be taken into consideration, namely, the purity of the juice. By the purity of the juice, or, as it is expressed in the tables, the coefficient of purity, is meant the ratio of pure crystallizable sugar in the juice to the total solids therein. For instance, if in 100 parts of solids there are 80 parts of pure crystallizable sugar, the coefficient of purity of that juice is said to be 80. The number 80 may be taken as a fair average which should be attained in this country. In the older beet-growing countries a much higher degree of purity can be obtained than this. The degree of purity of the juice is influenced chiefly by the amount of salts which are represented in the analysis by the ash obtained on the ignition of the sample. In soils highly impregnated with mineral substances, such as are often found in our western countries, the percentage of ash will be found very high, and there will be a corresponding depression of the purity coefficient. In lands, however, which have been long cultivated, and scientifically treated from an agricultural point of view, the percentage of ash in the beet will be diminished and the purity coefficient correspondingly raised. The ash of the beet consists largely of phosphoric acid and potash, and these two substances are essential to the proper growth of the beet. It is therefore not expected that the ash of the beet shall be reduced below a certain content, otherwise the growth and maturity of the plant will be retarded. It will not be possible in the space which is at our disposal here to discuss each of the series of data obtained by these analyses, but the above remarks are made for the purpose of enabling anyone who is interested in any particular series or analysis to discuss it intelligently and determine from the numbers given the value of the beets produced for sugar-making purposes. At the present time, for the purpose of fixing a standard of comparison, I would say that the typical sugar beet for sugar-making purposes should weigh 600 grammes, contain 14 per cent of sugar, and have a purity of at least 80. With such raw material at his disposal in sufficient quantity, the manufacturer can not fail of success, provided he be supplied with the latest and most improved forms of machinery.

It may also be of interest in connection with the data above given to discuss some of the particular qualities of the beet separately. In general the mistake is made by those not acquainted with the principles of the growth of the sugar beet and manufacture of beet sugar of judging of the possibilities of success by the percentage of sucrose in the beet alone. The danger of relying solely upon this constituent of the beet is at once manifest from the considerations above mentioned. Nevertheless, as it is often done, I have collected into tabular form from the analyses given all of the sugar beets showing from 15 to 18 per cent of sugar in the juice, which were analyzed by the Department at Washington during the past season. In another table have been collected all the beets in the juice of which more than 18 per cent of sugar was found. In the case of Minnesota 3 samples of beets were found in which the percentage of sugar was more than 18; in the State of Indiana, 1 sample; in Iowa, 1; in North Dakota, 4; in Maryland, 5; in Colorado, 1; in Wyoming, 1; in Nebraska, 13. Of beets showing a percentage of sugar from 15 to 18 in the juice the following numbers of samples were found: In Illinois, 3; in Minnesota, 15; in Nebraska, 36; in Maryland, 8; in Iowa, 4; in Wyoming, 2; in Colorado, 9; in North Dakota, 4; in Massachusetts, 1; in Wisconsin, 2; in California, 2; in South Dakota, 6; in Michigan, 4; in Kansas, 3; in Washington, 1; in Oregon, 2; in Virginia, 2.

The production of beets containing from 15 to 18 per cent of sugar is not unusual, and such beets may be regarded as strictly normal in constitution, but possessing a particularly high content of sugar. When, however, the content of sugar in the beet exceeds 18 per cent it must be regarded at the present time as something abnormal and due to peculiar conditions affecting the particular locality, or even the particular plant itself. Such beets are usually extremely small in size, and the richness of their sugar content has been acquired at the expense of normal growth. In other cases the effect of a particularly dry season preceding the time of harvest or other very peculiar conditions may affect the sugar content. In many other cases, from the wilted condition in which the beets have been received, it must be admitted that a portion of the water which they contained has dried out between the time of harvest and the time of analysis, thus increasing the apparent percentage of sugar in the beet. It will doubtless be possible hereafter, when the beet has been more fully developed by careful selection, to produce beets normally which contain more than 18 per cent of sugar, but to expect at the present time the production of such beets on a large scale would be unreasonable, and such an expectation would not be realized. Even when we consider the other class, namely, those containing in their juice from 15 to 18 per cent, we must confess that it would be unwise to look for a production of beets on a large scale containing so large a percentage of sugar. In many of the cases of beets of this class the high sugar content must be ascribed primarily to some of the conditions mentioned for the class above 18.

When, however, the tables are further studied, and the remarkably low percentages of sugar are noticed which were sometimes found, it must be confessed that in these cases the abnormally low content of the sugar is also due to the abnormal growth of the beet. In some cases these beets are of abnormal size, weighing 2,000 grammes or over, and to this extraordinary growth must be attributed to a certain extent the low content of sugar. In general, it has been found that when beets exceed 600 grammes in weight it is difficult to maintain their sugar content at a high standard. When, therefore, the beets become immensely overgrown it is always accompanied with a falling off in content of sugar. In the cases, however, of the small beets which have shown a low content of sugar, the result must have been due to defective conditions of soil and climate, or to defective methods of planting and cultivation, or to premature harvesting.

When we consider the varying qualities of beets which have been grown from the same seed, we are at once struck with the immense importance of the factors of soil, climate, and cultivation, in the production of the sugar beet. In the fact that the seed of the Klein Wanzlebener variety of beet in the hands of different farmers will show a variation of from 6 to nearly 20 per cent of sugar, it must be confessed that we have in soil and climatic conditions, and in methods of cultivation, a more potent means of influencing the sugar content of the beet than is found in the germ of the seed itself.

It can only be expected that a sugar-beet seed which is high bred will be able to reproduce its kind when it has become fully acclimated and has received in its new condition the same scientific treatment and selection which it had in its original home. The great hope, therefore, of uniform production of sugar beets high in sugar-producing power in the United States must be found in the establishment of culture stations where different varieties of beets can become fully acclimated, and where they can receive the same careful scientific culture and selection which have brought them up to their present state of excellence in Europe.

APPENDIX.

NOTES ON SUGAR-BEET CULTURE IN FRANCE AND GERMANY.

By Walter Maxwell.

These notes are not intended to be a report upon the sugar-beet industries of France and Germany, nor in any measure a statement of the actual present condition of the sugar-growing industry of Europe, but rather as a short record of observations made during a tour through some parts of those countries, and more especially as a repetition of conversations held with certain distinguished authorities.

It will be found that the statements of several of the authorities have already been given in certain of the sugar journals, and are not new; however, it will be of value to repeat these opinions, and particularly in connection with the circumstances under which they were made.

The statements of the authorities cited were made in reply to precise questions, and I have endeavored to reproduce them exactly as they were given.

CLIMATE.

Prof. A. Girard, of the Conservatory of Arts and Industries, Paris, whose studies of the sugar beet are well known, made the following observations:

"The greatest number of our beet-sugar factories are established in that part of France extending from the center to the north and passing through the eastern provinces, where the climate is a temperate one; where the yearly amount of rainfall during the growing season is favorable to an even development of the beet, and where the summer lasts just long enough to mature the roots before the frosts set in. That part of France has been considered the best and the only part adapted to the cultivation of the sugar-beet. Until lately it has been held that beets could not be grown with any measure of success in the south of France, on account of the hot, dry weather which prevails during the summer and the heavy rains in autumn, which cause a second or delayed growth. That opinion has now changed, and two factories are well established in the south—Beaufort, Department de Vaucluse, which produces 10,000 bags of sugar, and Laudun, Department du Gard, thus showing that with proper cultivation, fertilizers, and irrigation the culture of the beet in that part of France is also possible."

Respecting the action of climate upon beets and beet seeds grown in the north and in the south of France, respectively, M. Henri Vilmorin, Paris, said:"

"The influence of climate on the characteristics of the seed of a given variety of beet is not perceptible if only exerted for one year. We had seed grown from the same batch of stock-seed in the north and south of France, and no difference whatever was observed in the features of the roots. The seed from the south, however, was generally of a brighter color, drier, and of a slightly stronger growth."

Although it is held that given climates are specially adapted to culture of the sugar beet, in the words of Professor Girard "the results of more recent experiments, and particularly where the conditions of growth have been largely within experimental control, indicate that it must not yet be said where the beet can not be successfully grown."

SOIL.

"Is there anything to be added to or taken from the opinions of Chaptal, Vivien, or Basset in respect to the soils most or only adapted to the growth of the sugar beet?"

In reply to this question Girard said: "It would take a long time to detail all the kinds of soil which are or can be made suitable to the culture of the sugar beet, since with peculiar culture, the right fertilizers and chemicals, good beets may be grown wherever mangolds succeed. However, it is still held that the kinds of soil which are of a light rather than too compact a texture, containing a given amount of calcareous matters, or having a chalky subsoil, with good natural or artificial drainage, should give the best results. It is well known that fresh soils from old forests or virgin prairies, which are not only acid but also contain an excess of undecomposed organic matter, are unfit for the sugar beet. Lands on which sheep have been fed are likewise in an unsuitable condition to follow with beets for sugar purposes. But this, in some measure, depends upon the variety of beets to be grown. If a soil is full of nitrogenous matter it is, in general, not in a condition in which most beet varieties will grow and form sugar. It has been shown, however, that certain varieties will thrive in such unfavorable (generally) conditions, and this is a matter for special consideration."

Late in September of 1890 a visit was made to the farm and factory of MM. E. Dufay & Co., Chevry-Cossigny, Department of the Seine et Marne. The farm is comprised of some 700 acres, with an annual acreage of beets of about 170 acres. Contracts, which run on with a good understanding from year to year, are made with the large and well-to-do farmers in the immediate neighborhood, whose supplies bring up the total annual acreage of beets worked by the Dufay factory to about 2,000 acres.

In the course of our conversation upon the nature of Chevry-Cossigny soils and of soils adapted to growing sugar beets, M. Dufay gave me the following data showing the relation of the clay and sand in the soils generally of his farms:

In 1,000 *parts of soils.*

Clay	707	674	673	629	681	658	680	609
Sand	292	326	327	371	319	340	320	391

M. Dufay said: "I consider a soil which is composed of about two-thirds clay and one-third sand to be well suited for the sugar beet."

But M. Dufay's knowledge of his soils was not limited to the relative amounts of clay and sand of which they are composed. He furnished some equally precise data showing the relative quantities of nitrogen, phosphoric acid, potash, and lime in the soils of his farms, whose clay and sand composition has been given:

In 1,000 *parts of soils.*

Nitrogen	.96	.97	.99	.94	.98	.80	.94	.83
Phosphoric acid	1.50	1.75	1.75	2.15	1.35	1.80	1.15	1.95
Potash	1.53	2.29	1.91	1.96	2.39	2.53	2.82	3.11
Lime	7.20	10.50	8.50	9.90	8.20	9.70	7.20	.50

M. Dufay said further: "A soil may be said to be well adapted chemically for the culture of the beet when the constituents spoken of are present in the following proportions:

"In 1,000 parts of soil—1 part of nitrogen, 1 part of phosphoric acid, 2½ parts of potash, 30 parts of lime.

"My soils are deficient in lime by two-thirds, and I have to add lime continually. The presence of constituents which act against the formation of sugar, such as the alkali salts, is too small to be observed."

CULTIVATION, FERTILIZATION, AND SEEDING.

With the general principles of cultivation of soils for growing sugar beets we are abundantly supplied on all sides. It is, though, of more interest and special value to know just how certain authorities manage, and what are their ways and methods, who are well known by their great success. It is specific knowledge that we want, and the actual facts from men who, during a length of years, have got great results.

Early in September I went over the farms of Messieurs Vilmorin, Audrieux & Co., at Verrières, near Paris. The farms comprise some 120 acres, which are exclusively used for horticultural and agricultural experiments.

Going over the plots, which were bearing the experimental sugar beets, I put some questions to the practical farm manager and carefully took his replies. These data should be of very special interest, as we are speaking of the actual management of the plot of the "Improved Vilmorin" for the year 1890, which is the latest in the series of trials dating from the year 1850.

"What is the soil of this plot, and does the soil vary much over your farm?"

The manager replied: "Just here it is a deep sandy earth and in places almost a sand. In other places it varies from a sandy to a heavier loam. We have no chemical analyses of our soils.

"Although the land lies flat, the natural drainage is in general enough; only in places has it been necessary to put in tile drains, as the beet does not require a dry earth. It is on the whole a dry surface soil lying upon a subsoil of more than average moisture."

"Now, how has this plot been cultivated from the first up to the present?"

"Last October the land was plowed to a depth of 10 inches, and after this plowing superphosphate of lime was added at the rate of 28 grams per square metre. After sowing the fertilizer the land was replowed, and to a depth of 16 inches, and left in that condition till the following April.

"At the latter part of April the land was replowed very deeply, scuffled, harrowed, and rolled until the soil was in a fine state, and the seed was put in."

"What was your mode of light cultivation?"

"As soon as the plantlets were out of the ground far enough to show the rows the hand hoe was used, not coming too near the plants. When the plants had four leaves the thinning out of the plants in the rows commenced. The plants were left 4 inches apart in the row at the first thinning. After the plantlets had grown so far that the roots were almost as thick as the thumb a second thinning took place, which left the plants as they stand—either 8 or 12 inches apart, according as it was determined. In the thinning process care was taken to leave the most promising plants.

"The ground was frequently hoed during the early season of growth to keep down the weeds and to open up and keep porous the surface. The hoeing was done exclusively by hand, no horse implement being used.

"If it is found, as it was this year, that the plants appear weakly, and the young leaves are of a yellow color, a second quantity of fertilizer is added, composed of equal quantities of superphosphate of lime and nitrate of soda, and at the rate of about 30 grammes per square metre.

"It is seen that no farm-yard manure was applied to the land for beets. Usually it is given to the preceding crop, in order that the excess of organic matter may be used up; yet a certain amount remains when the beets are planted. Our method of fertilization is usually as I have given it to you."

"What rotation, or rotations, do you follow with the land which is used for your seed beets?"

"Our mode of cropping is not a fixed one. This crop of 'mother' beets is growing after the following rotation of crops: 1886, beets; 1887, peas; 1888, wheat; 1889, potatoes (heavily manured); 1890, beets.

"Another rotation which has been followed is, beets, wheat, potatoes, peas, beets. In every case our rotation allows of three years of other crops between the crops of beets."

The practical example of cultivation which has been given applies to the growing of beets exclusively for seed or propagation uses. It will be of value to recite some notes taken from the system of a practical farmer and sugar manufacturer, whose beets were grown for factory purposes.

Dufay made the following remarks to my questions concerning his system of cultivation, fertilizing, and general management:

"Immediately after the harvesting of the grain crop where beets are to follow in the coming year, the ground is broken up about 4 inches deep with the plow, harrowed, and rolled with a 'croshill.' Almost immediately fine farm-yard manure is added, varying from 8 tons to 16 tons per acre, according to the known condition of the soil, and the ground is plowed to a depth of from 8 inches to 12 inches, and in this state left until the spring. I must here insist upon the need of deep plowing for sugar-beets. Where the less quantity of farmyard manure is used the deficiency is made up sometimes by the use of cotton-seed meal, applying about 1,000 pounds per acre, which is done in December, or at the time of deep plowing.

"In the spring, beginning even in March, we commence getting the seed bed ready. Since these operations depend solely upon the nature of the soil, the weather, and other circumstances, a direct rule can not be given. A practical man acts and does just what is best at the time, and a man who is not practical can not carry out a rule. But in a few words, in preparing the soil for the seed of the sugar-beet the end to be reached is to get the earth, chemically and mechanically, into a completely homogenous state; for only in this condition can we count upon a sure harvest of sugar-yielding beets."

In speaking somewhat in detail of the nature and quantity of artificial or chemical fertilizers which M. Dufay applies in addition to the farmyard manure mentioned, he furnished the following formula from his memoranda:

	A.	B.	C.
	Lbs.	*Lbs.*	*Lbs.*
Sup. phos. lime	1,000	750	1,500
Potass. chloride	625	425	425
Amm. sulphate	375	250	250
Nitrate of soda	850	375	375
Sulphate of lime	500	125	125
	3,350	1,925	2,675

The mean cost per acre of the quantities of these fertilizers is about 60 francs ($12).

The cost per acre of producing the year's crop was given as follows:

Farmyard manure	$28.00
Fertilizers	12.00
Spreading manure	.60
Spreading fertilizers	.25
First plowing	1.60
Harrowing and rolling after plow	.64
Plowing and subsoiling	4.60
Two scarifyings	2.00
Two harrowings	.64
Two rollings	.64
Cost of seed	3.00
Sowing of seed	.80
Harrowing and rolling again	.64
Three times hoeing with horse	2.40
Hoeing by hand	4.80
Harvesting by hand	4.00
Harvesting by machine	1.60
Carting to factory	2.40
Total	70.61

To the figures stated are still to be added the rent of land and taxes, $9.40, making a total of $80.01.

M. Dufay added: "The average per acre is from 12½ to 18 tons. The content of sugar year is 16 per cent of the weight of the beets and 17 per cent in the juice. If my crop averages in any year only 12 per cent of sugar in the beets, then it nearly pays the cost of production. Every pound above 12 per cent. is profit. This year we shall do very well. The only varieties of beets grown by me are the 'Improved Vilmorin' and 'Desprez,' and the seed is obtained each season direct from those firms."

The cost of production per acre given by M. Dufay is high. An approximate estimate of cost, expressed during conversation with a member of the Trotha Bros.' factory, Halle, Saxony, was lower; but the details were not given with such precision as to be worth stating. A general estimation of the cost per acre, furnished me by M. G. Dureau, Paris, though somewhat lower, was about the same as the figures in the Dufay statement.

The question of intensive culture, or high farming, which lies at the very root of success in sugar-beet growing, will be spoken of later and in connection with some other considerations.

SEED BREEDING.

In the course of conversation and communications with such authoritative sources as Messrs. Dippe Bros., Rickmann (formerly Rabbethge & Giesecke), and M. Henri Vilmorin, no very specific data were obtained which have not already been communicated through the journals. A conversation, however, which was held with M. Henri Vilmorin, and which sets forth the principle and emphasizes the main features of the Vilmorin system of seed breeding, has a value that deserves to be repeated; and more especially in the light of the opinion and comments expressed by Professor Maercker, Halle, Saxony. Maercker said: "It must be admitted fully and by all that the Vilmorin firm had led the way in the improvement of the beet for sugar purposes. In the 'Improved Vilmorin' we had the first great representation of what could be done in the direction of increasing the sugar-forming quality of the beet."

M. Vilmorin spoke as follows: "The experiments for the improvement of the sugar-beet were commenced at Verrières in 1850, by my father. The object held in view was the formation and fixing of a race containing a higher per cent of sugar and a more even composition than the races then in use.

Several methods of selection were successively tried. First, dipping the roots in liquids of great specific gravities. This system was unreliable in the case of the whole roots in consequence of the presence of air cavities in the neck, which made some roots float which should have sunk; and in the use of small pieces or sections of beets fermentation of the liquids was induced, or strong endosmotic effects altered the results.

"Finally, it was found to be more exact to take a small cylindrical piece from the beet and to ascertain the specific gravity of the juice from the pulp. This was done by means of weighing a silver button in the juice. The roots were numbered in each individual and the richest in sugar kept for seed; and the same process was applied to the beets grown from the seed of the previously selected roots or 'mother beets.'

"The process stated was followed till 1872, and the 'Improved Vilmorin may be said to have been formed by that system of selection, the roots giving juice of the highest specific gravity being held to be the richest in sugar. The office of the polariscope is now added to the above process."

M. Vilmorin continued: "I consider it the most important point in the selection and growing of beets for seed that the roots be grown under such conditions that they freely and fully develop all their good and bad qualities. The system of growing beets for seed on very rich land, but very thickly together, is a great error, as this process hinders the formation of lateral roots, and at the same time greatly increases the content of sugar in the roots, so that they are made to appear of a better form and of a higher sugar quality than they really are. Now, in order to secure a perfectly just appreciation and proof of our 'Improved' beets, they are grown on exactly the same principle and by the same method as beets that are grown for the factory."

The method of cultivation and general management of the plot of "mother" beets on the Vilmorin farm is given on an earlier page, and exactly as received from the practical manager.

In speaking of the system of selection, M. Vilmorin continued:

"Only roots of perfect shape and weighing not less than 600 grammes are tested in the laboratory. Each single root is numbered, which number remains quite legible even after the root has been planted and borne seed.

"The seed of each individual root is harvested separately and kept by itself in a paper bearing the same number that was upon the root.

"The next year a trial is made with a small sample taken from each paper and the bulk of the seed is still kept back till after the roots grown from the sample have been tested.

"This is practiced as a precaution against the possibility of the progeny from a good beet falling far below the accepted standard of quality, which is a rare thing, but by no means unknown, even after long breeding in one line.

"After the previous test, all such beets as have not given satisfactory results are thrown away, and the seed from which such underquality beets were grown left unused. Of course the season and certain other circumstances have to be borne in mind in selections of each year, as in some years roots with 16 per cent of sugar may be relatively better than certain roots containing 20 per cent in some other years. To ascertain, however, the influence of the weather, some good lots of seed have been tested several years in succession and with a view to establishing the variation and error due to climate.

"All the seed that has been proved by the first year's test to be up to the standard of quality is sown the next year, and very thin and carefully, and from it a crop is grown more than a thousandfold the weight of the original seed.

"It is thus seen that any and all seed of the 'Improved Vilmorin' has come from stock-beets weighing not less than 600 grammes, all of which were for successive generations perfect in shape, color, proportion of sugar, and purity of juice; and only once has it occurred, and when the seed was grown for commercial use, that the seed was raised from beets of less size than 600 grammes.

"By the system of severe and unflinching constancy of selection that I have described to you, the 'Improved Vilmorin' beets have been brought to their present high standard of fixed economic qualities.

"The more marked characteristics of our beets are the hardness of flesh, which is at least equal to that of a Swedish turnip, the dull white and rough, rather smooth skin. The leaves, which are numerous, are strong and of a dark-green color, which, in the fall, like the foliage of most beets, droops down around the root."

SOME CHARACTERISTICS OF CERTAIN VARIETIES.

No effort was made to obtain information in general on the number, and constantly increasing number, of varieties which are being put upon the market. Our attention was directed only to one special characteristic, which is found to be the property of some varieties more than of others, viz, the capability of a beet to resist such unfavorable outward conditions of growth as climate, unfitness of soils for beets in general, in consequence of the presence of excesses of undecomposed nitrogenous matter. We shall give the statements of authorities direct on particular phases of this inquiry.

Franz Schindler, professor in Riga, said: "All the three types, Vilmorin's Improved White, Vilmorin's Early Rose, and the Improved (with Vilmorin) Klein-Wanzlebener, developed exactly their proper characteristics as well in Kwassiz, Moravia, as in the neighborhood of Riga, Russia, although the latter place is about a thousand miles farther north than the former. And all three types remained true not only in point of sugar content and other biological qualities, but also in anatomical structure. The climate of the two places is extremely different, and, moreover, the beets were grown in Kwassiz in an excellent beet land and under correct cultivation, while at Riga they were raised on a sandy soil rich in vegetable mold and largly manured with stable manure.

Now, it has been found by Deherain, in France, and also by Schindler and de Proskowetz in Russia that "the Vilmorin beets contain a higher proportion of fibrous to cellular tissue than any other types of sugar beets, and the amount of sugar being corelative with the fibrous tissue the higher sugar content is easily understood."

From notes sent by MM. Jacquemart and Delamotte, sugar growers and manufacturers at Quessy, Department Aisne, "beets of the 'Improved Vilmorin' were grown comparatively on the same field with doses of nitrogen amounting respectively from 37½ to 75 pounds per acre. The drought interfered with the action of the manure, but it was seen that the beets grown with the double allowance of nitrogen were of better quality than the others."

The value, respectively, of the types and kinds of beets is regulated by other conditions than the content of sugar—such as the production by weight per acre, etc. Professor Maercker said: "For a time the 'Improved Vilmorin' almost entirely substituted the Klein-Wanzlebener in Saxony on account of its high content in sugar. It has been found, however, that the 'Improved Vilmorin' does not produce the weight per acre, and has not succeeded as well with us under certain indifferent conditions as the Improved Klein-Wanzlebener. Consequently in our district (Halle and Magdeburg) the Improved Vilmorin has been replaced largely by a cross between the Improved Vilmorin and the Klein-Wanzlebener, which cross very specially combines the richness in sugar of the former variety with the greater productiveness by weight of the Klein-Wanzlebener."

There are two fundamental economical conditions which control very largely the varieties of beets which shall be grown, in addition to the climatic and soil conditions, of which we have already spoken. Those conditions are: The system of taxation obtaining in each district or country. If the taxes are levied on the weight per acre of the roots, then it is specially advantageous to have the largest quantity of sugar contained within the smallest weight of raw produce or beets. If the tax is upon the manufactured product, the condition does not exist in the same form. The second fundamental condition regulating the variety of beets to be grown is devolving upon the consideration as to whether the beet crop is being grown exclusively for the sugar without secondary purposes, or whether the beet crop, as well as being grown as a direct source of profit in the form of sugar, is cultivated as part of a large and general rotation of cropping. Upon farms where live stock and the providing of food for such is an essential item in the economy, the difference between 20 tons and 35 tons per acre of beets is to the farmer a weighty consideration and often a decisive condition.

The substance of the observations made to me by many sound authorities on the relative and particular merits of respective varieties have inclined me to the following conclusion: As a variety for the highest and most concentrated production of sugar, for the withstanding of the unfavorable effects of certain climates and soils, and for use in new soils and such as are not habituated to the growth of the beet plant, no better beet can be adopted than the Improved Vilmorin. And again, as an all-round valuable beet, suitable to the farmer as a source of direct profit and as part of his system of mixed and general agriculture, as well as to the manufacturer of the sugar, the Improved Klein Wanzlebener is spoken of with unhesitating recommendations.

ECONOMICAL CONSIDERATIONS.

Many conversations were held with well-known authorities in France and Germany upon features of the sugar-beet industry that may be termed more specially economic. The substance of what was obtained will be given as the result of a conversation with Professor Maercker on some of the economic features of the industry. In conclusion will be given a conversation held with M. Tisseraud, permanent secretary of the department of agriculture of the Government of France.

Professor Maercker, in reply to questions, made the following remarks: "Owing to the very nature of the manufacture of sugar from beets, in which large and costly machinery plants are necessary, it is not possible for small owners or holders of land to grow beets and to make sugar therefrom on their own farms. The acreage of beets grown by such farmers individually could not pay for the investments necessary to the manufacture.

"There was only one of two courses by which it was possible to introduce beet culture among farmers generally, and as a great and general industry. The first method by which it could be done was by the farmers contracting with the large growers and owners of factories to grow a given acreage of beets and deliver the same to the factories under given conditions, as is the system in France. A second system was the uniting of the farmers among themselves and thus forming manufacturing companies (Actien Fabriken). The articles of these corporations or companies require that each member shall supply a given acreage or weight of beets to the factory, and according to conditions fixed upon by the board of control.

"With the founding of the latter system, which is the prevailing one with us, the growing of beets by the great farming class in the beet districts became solidly established. It was the opening of a new era of agricultural prosperity when the industry was made to prevail. The small owners and farmers, whose farms are comprised generally of from 50 acres to 120 acres, and quite exceptionally reaching 250 acres, became manufacturers of sugar as well as growers of the beets by accepting a direct interest in the owning and conducting of the factories."

In reply to the question "Have the owners of large private factories or the companies paid the best? And which system has done most for the industry?" Professor Maercker replied: "The undertakings of the large owners (gross Herren) are conducted with method and have the advantage of large capital, but there is not the degree of enterprise and care of detail characteristic of the companies (klein Herren) as represented by the farmers.

"The 'klein Herren,' being practical farmers, are well up in thorough and economical culture. They enter into the industry with the care and enterprise which their smaller conditions have always forced upon them; and as regards the technical or manufacturing part of the industry the companies composed of the farmers have shown an intelligence, ingenuity, and enterprise which has placed them in advance of their competitors of the 'large system.' The companies were the first to introduce improved methods of extracting the sugar from the beets, such as the diffusion method.

"Our farmers are in good circumstances, which have been improved with their general system of agriculture by the introduction of the sugar-beet industry. They are rich and free."

The German has most decided features of advantage over the French system. In Germany the growers of the beets are the manufacturers, and they reap a gain in the growth of the beet and the production of the sugar.

The system of farmers supplying beets under contract to large factories always places the growers at some measure of disadvantage; and where factories are large and isolated in wide districts, and the factory owners have little interest in the general agricultural interests, the result to the farmer may be, and is often, calamitous."

To M. Tisseraud, who is the permanent secretary of the department of agriculture of France, and who is not only conversant with the sugar-beet industry of France, but of whom it may be said that he holds French agriculture in his right hand, we have to express our obligations, not only for the general candor and copiousness with which he replied to our inquiries, but also for a very special politeness in causing certain data for the current year (1890), which had not at that time been published, to be furnished to us in manuscript.

The following observations were made in reply to certain carefully prepared questions which were put to the secretary in the order in which his remarks proceed:

"The very nature of the cultivation of the beet tends to make it an industry more adapted to growers, if not essentially on the large scale, at least who are not small in the sense that our peasants are, who cultivate from 5 to 10, or even from 20 to 30 acres. The culture of the sugar beet, if it is to be a success for the making of sugar, must be done well. The grower must be a man of capital, who can invest liberally per acre in the form of modern implements, of abundant labor, both manual and animal, at the right season, and who can purchase largely and with judgment of chemical manures, such as superphosphates. The soil must be plowed deeply and cultivated thoroughly, which means good implements and horses; it must be kept in clean condition, which means much labor; and it must be well fertilized with costly manures, which means a large outlay. Now, these conditions of the successful culture are not within the compass of our small peasant farmers. The larger farmers, *i. e.*, such as occupy enough land to bear investment in implements, labor, and manures, are capable of growing beets with as great success as the owners and holders (tenants) of the large tracts which exist in the districts where our sugar industry is making the greatest progress."

"What is now the tendency in France in respect to the 'large *vs.* small' system of beet culture?"

"The tendency is toward obtaining large tracts of land, where the heavy investments, in labor, implements, and manures, of which I have spoken, can be made most remunerative, and the facilities for manufacture of sugar are most complete. In the northern departments of France, where the culture is on the large system, the industry is expanding and gaining the most ground."

"What has been the effect of legislation upon the development of the sugar-beet industry, agriculturally, and also through the beet industry, upon your agriculture in general?"

"Before the year 1884 the farmers who grew beets to supply the factories had no interest in producing beets of high quality and with a large content of sugar. The law, as it at that time existed, made it most advantageous to the farmers to produce weight or quantity, as it was not merely the same to them in the price per ton that they obtained. They also grew a much larger weight per acre for sale and had a correspondingly larger amount of pulp for feeding their cattle. The manufacturers, on the other hand, were being ruined by the operation of the law of that date. (See the law before 1884.) The law of 1884, however, altered these conditions. Under this law it became necessary to grow beets with a higher content of sugar, which not only were worth manufacturing, but which were found to be equally worth growing by the farmers, as the sugar factories were able to pay the growers $6 to $7 a ton instead of $4 to $5, as had been formerly paid. This change in the law affecting the sugar industry brought about the great improvement in the culture of the beet which has occurred in the last few years. In the first place, the improvement of the seed has taken the lead in consideration, and varieties have been produced and grown which were very rich in sugar. In the second place, the modes of cultivation have been improved and the application of chemical fertilizers increased up to the standard of the most intensive culture or high farming, all of which conditions are the essential factors of success in growing sugar beets."

"Are you of opinion that the successful growing of beets for a sugar-making purpose is only possible where 'intensive culture' or high farming obtains?"

"That is strictly the case. Sugar beets pay better than any other agricultural crop for high culture, and they can be made to pay only where 'high farming' is practiced. If you grow beets, grow the best that high culture can produce. Unless you farm well, have land in high condition, with liberal manuring and abundant labor, don't attempt to grow beets. Grow wheat, potatoes, or what you like, but don't grow beets. * * * We are not only increasing our productions in comparison with former periods, we are holding our place in competition with the world."

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